Vol. 1110 Number 2

OFFICIAL GAZETTE

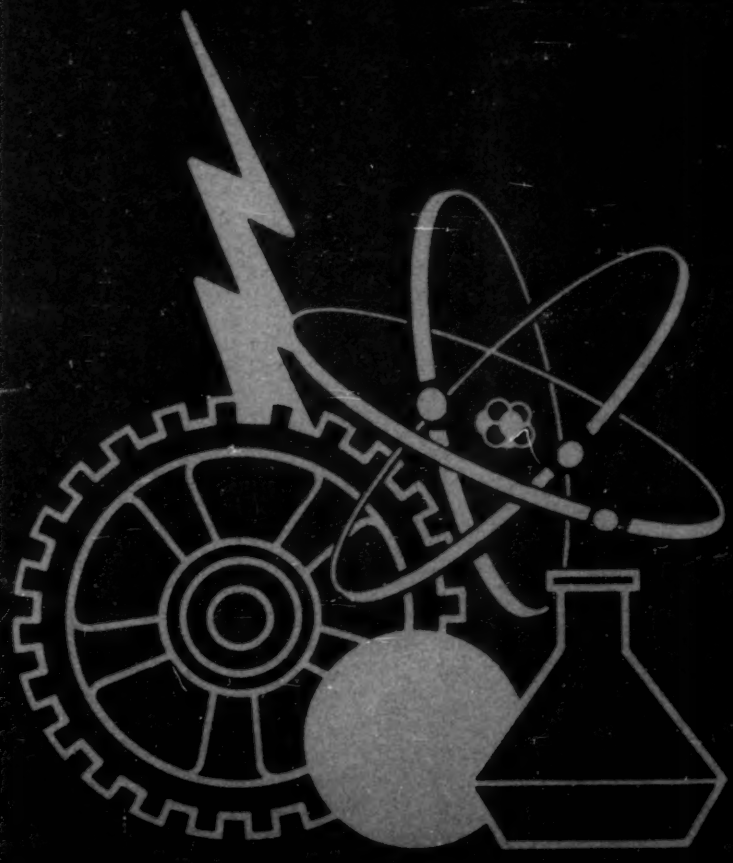
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 9, 1990



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

January 9, 1990 Volume 1110 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	
—If paid on or after Jan. 1, 1990	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 6, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,633,526 through 4,635,299
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 4, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,366,579 through 4,367,560
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 22, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,295,403	06/220,080	10/20/81
4,296,138	06/217,810	10/20/81
4,547,905	06/593,543	10/22/85
4,547,906	06/508,385	10/22/85
4,547,910	06/460,997	10/22/85
4,547,919	06/467,546	10/22/85
4,547,922	06/572,116	10/22/85
4,547,924	06/510,667	10/22/85
4,547,925	06/380,740	10/22/85
4,547,926	06/558,374	10/22/85
4,547,928	06/543,096	10/22/85
4,547,929	06/575,587	10/22/85
4,547,935	06/646,934	10/22/85
4,547,940	06/506,621	10/22/85
4,547,946	06/579,650	10/22/85
4,547,947	06/588,801	10/22/85
4,547,949	06/582,754	10/22/85
4,547,963	06/504,421	10/22/85
4,547,966	06/639,461	10/22/85
4,547,973	06/655,909	10/22/85
4,547,974	06/652,258	10/22/85
4,547,975	06/577,798	10/22/85
4,547,984	06/593,913	10/22/85
4,547,988	06/514,815	10/22/85
4,547,989	06/624,681	10/22/85
4,547,990	06/548,991	10/22/85
4,547,991	06/593,523	10/22/85
4,548,001	06/264,393	10/22/85
4,548,003	06/473,330	10/22/85
4,548,013	06/608,561	10/22/85
4,548,019	06/557,731	10/22/85
4,548,026	06/602,679	10/22/85
4,548,028	06/477,797	10/22/85
4,548,031	06/508,262	10/22/85
4,548,035	06/441,105	10/22/85
4,548,036	06/443,112	10/22/85
4,548,040	06/609,902	10/22/85
4,548,046	06/601,605	10/22/85
4,548,054	06/587,019	10/22/85
4,548,059	06/536,910	10/22/85
4,548,060	06/554,996	10/22/85
4,548,064	06/524,833	10/22/85
4,548,073	06/599,554	10/22/85
4,548,081	06/632,924	10/22/85
4,548,113	06/614,562	10/22/85
4,548,115	06/487,231	10/22/85
4,548,122	06/525,242	10/22/85
4,548,125	06/394,058	10/22/85
4,548,130	06/584,748	10/22/85
4,548,142	06/528,367	10/22/85
4,548,147	06/575,542	10/22/85
4,548,148	06/460,894	10/22/85
4,548,151	06/390,861	10/22/85
4,548,152	06/576,954	10/22/85
4,548,157	06/579,220	10/22/85
4,548,160	06/436,782	10/22/85
4,548,184	06/413,303	10/22/85
4,548,185	06/649,119	10/22/85
4,548,189	06/420,850	10/22/85
4,548,192	06/628,493	10/22/85
4,548,193	06/648,524	10/22/85
4,548,217	06/461,688	10/22/85
4,548,218	06/567,238	10/22/85
4,548,224	06/661,955	10/22/85
4,548,245	06/472,104	10/22/85
4,548,247	06/556,948	10/22/85
4,548,250	06/530,957	10/22/85
4,548,256	06/546,387	10/22/85
4,548,268	06/566,119	10/22/85
4,548,283	06/224,445	10/22/85
4,548,290	06/619,260	10/22/85
4,548,298	06/480,597	10/22/85
4,548,303	06/470,036	10/22/85
4,548,305	06/456,181	10/22/85
4,548,308	06/441,212	10/22/85
4,548,312	06/590,566	10/22/85
4,548,314	06/488,032	10/22/85
4,548,315	06/501,835	10/22/85
4,548,323	06/313,742	10/22/85
4,548,324	06/571,883	10/22/85
4,548,330	06/553,834	10/22/85
4,548,331	06/673,012	10/22/85
4,548,342	06/483,656	10/22/85
4,548,344	06/505,713	10/22/85
4,548,346	06/474,544	10/22/85
4,548,352	06/572,444	10/22/85
4,548,358	06/546,029	10/22/85
4,548,362	06/566,536	10/22/85

Patent Number	Serial Number	Issue Date
4,548,364	06/538,368	10/22/85
4,548,371	06/387,487	10/22/85
4,548,374	06/290,837	10/22/85
4,548,381	06/647,432	10/22/85
4,548,387	06/604,843	10/22/85
4,548,391	06/501,053	10/22/85
4,548,397	06/559,901	10/22/85
4,548,399	06/531,594	10/22/85
4,548,409	06/459,811	10/22/85
4,548,411	06/613,584	10/22/85
4,548,412	06/547,078	10/22/85
4,548,413	06/577,157	10/22/85
4,548,420	06/558,290	10/22/85
4,548,423	06/573,223	10/22/85
4,548,434	06/416,881	10/22/85
4,548,436	06/641,068	10/22/85
4,548,465	06/540,759	10/22/85
4,548,466	06/536,997	10/22/85
4,548,468	06/611,316	10/22/85
4,548,484	06/486,951	10/22/85
4,548,487	06/495,602	10/22/85
4,548,493	06/598,815	10/22/85
4,548,494	06/338,980	10/22/85
4,548,495	06/351,603	10/22/85
4,548,496	06/499,593	10/22/85
4,548,504	06/401,418	10/22/85
4,548,517	06/571,525	10/22/85
4,548,519	06/504,721	10/22/85
4,548,523	06/587,184	10/22/85
4,548,527	06/622,844	10/22/85
4,548,533	06/602,356	10/22/85
4,548,538	06/445,043	10/22/85
4,548,540	06/652,280	10/22/85
4,548,541	06/517,290	10/22/85
4,548,545	06/481,806	10/22/85
4,548,551	06/607,157	10/22/85
4,548,552	06/581,500	10/22/85
4,548,604	06/437,039	10/22/85
4,548,609	06/570,208	10/22/85
4,548,639	06/425,801	10/22/85
4,548,640	06/544,321	10/22/85
4,548,658	06/696,438	10/22/85
4,548,663	06/587,472	10/22/85
4,548,665	06/587,895	10/22/85
4,548,680	06/351,488	10/22/85
4,548,693	06/617,860	10/22/85
4,548,694	06/657,915	10/22/85
4,548,696	06/671,780	10/22/85
4,548,698	06/575,873	10/22/85
4,548,709	06/628,117	10/22/85
4,548,718	06/535,569	10/22/85
4,548,730	06/510,612	10/22/85
4,548,753	06/572,242	10/22/85
4,548,754	06/525,844	10/22/85
4,548,763	06/557,782	10/22/85
4,548,770	06/552,939	10/22/85
4,548,793	06/458,148	10/22/85
4,548,794	06/516,236	10/22/85
4,548,796	06/512,447	10/22/85
4,548,802	06/638,255	10/22/85
4,548,803	06/638,283	10/22/85
4,548,805	06/566,032	10/22/85
4,548,808	06/621,378	10/22/85
4,548,809	06/594,486	10/22/85
4,548,812	06/603,059	10/22/85
4,548,815	06/538,767	10/22/85
4,548,818	06/323,955	10/22/85
4,548,821	06/702,361	10/22/85
4,548,832	06/476,483	10/22/85
4,548,849	06/505,906	10/22/85
4,548,850	06/694,925	10/22/85
4,548,854	06/709,934	10/22/85
4,548,860	06/379,297	10/22/85
4,548,863	06/676,096	10/22/85
4,548,867	06/521,833	10/22/85
4,548,882	06/582,954	10/22/85
4,548,902	06/499,991	10/22/85
4,548,907	06/531,957	10/22/85
4,548,913	06/560,356	10/22/85
4,548,914	06/709,821	10/22/85
4,548,931	06/538,856	10/22/85
4,548,934	06/518,901	10/22/85
4,548,936	06/375,106	10/22/85
4,548,960	06/554,778	10/22/85
4,548,961	06/698,054	10/22/85
4,548,967	06/621,299	10/22/85
4,548,984	06/687,217	10/22/85
4,548,988	06/528,168	10/22/85
4,548,989	06/403,626	10/22/85
4,549,007	06/672,211	10/22/85
4,549,012	06/639,901	10/22/85
4,549,014	06/647,787	10/22/85
4,549,018	06/522,472	10/22/85
4,549,020	06/508,437	10/22/85
4,549,027	06/479,060	10/22/85
4,549,031	06/669,496	10/22/85
4,549,036	06/633,487	10/22/85
4,549,050	06/622,540	10/22/85
4,549,069	06/610,197	10/22/85
4,549,082	06/486,526	10/22/85
4,549,086	06/410,111	10/22/85
4,549,089	06/581,916	10/22/85
4,549,090	06/604,222	10/22/85
4,549,093	06/536,530	10/22/85
4,549,096	06/533,615	10/22/85
4,549,114	06/575,007	10/22/85
4,549,115	06/480,354	10/22/85
4,549,116	06/277,598	10/22/85
4,549,117	06/578,208	10/22/85
4,549,121	06/645,223	10/22/85
4,549,133	06/500,400	10/22/85
4,549,138	06/536,452	10/22/85
4,549,149	06/483,408	10/22/85
4,549,159	06/607,802	10/22/85
4,549,160	06/517,725	10/22/85
4,549,162	06/567,347	10/22/85
4,549,168	06/539,485	10/22/85
4,549,170	06/493,380	10/22/85
4,549,179	06/472,389	10/22/85
4,549,181	06/428,225	10/22/85
4,549,193	06/304,998	10/22/85
4,549,207	06/597,863	10/22/85
4,549,241	06/579,626	10/22/85
4,549,261	06/460,996	10/22/85
4,549,262	06/505,754	10/22/85
4,549,268	06/520,700	10/22/85
4,549,288	06/450,837	10/22/85
4,549,294	06/588,486	10/22/85
4,549,313	06/463,657	10/22/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1,21(b)).

4,787,919, Re. S. N. 442,572, Filed Nov. 29, 1989, Cl. 55/16, MEMBRANE SEPARATION SYSTEM AND PROCESS, Michael J. Campbell, et al., Owner of Record: *Union Carbide, Danbury, Conn.*, Attorney or Agent: Lawrence G. Kastriner, et al., Ex. Gp.:135

401,925, Re. S. N. 4,777,984, Filed Sept. 1, 1989, Cl. 138/98, METHOD FOR LINING A PIPE OR MAIN, Brian W. Strorah, Owner of Record: *British Gas Plc., London, England*, Attorney or Agent: None, Ex. Gp.: 242

4,692,600, Re. S. N. 404,906, Filed Sept. 8, 1989, Cl. 235/379, SYSTEM AND METHOD FOR AUTOMATIC TRANSACTION, Kenichi Takahashi, Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Thomas E. Beall, et al., Ex. Gp.: 235

4,642,682, Re. S. N. 442,145, Filed Nov. 28, 1989, Cl. 358/80, PHASE RESPONSIVE COMPOSITE VIDEO SIGNAL

CONTROL SYSTEM, Michael L. Orsburn, et al., Owner of Record: *Utah Scientific Advanced Development Center, Salt Lake City, Utah*, Attorney or Agent: Anthony B. Askew, et al., Ex. Gp.: 262

4,846,122, Re. S. N. 442,729, Filed Nov. 29, 1989, Cl. 123/179F PNEUMATIC STARTER FOR INTERNAL COMBUSTION ENGINE, John J. Kristof, et al., Owner of Record: *Sycon Corp., Marion, Ohio*, Attorney or Agent: Robert J. Fay, et al., Ex. Gp.: 342

4,836,020, Re. S. N. 441,159, Filed Nov. 22, 1989, Cl. 73/187, MARINE INSTRUMENT, Stephen G. Boucher, Owner of Record: *Airmar Technology Corp., Milford, N. H.*, Attorney or Agent: David E. Brook, et al., Ex. Gp.: 268

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexaminstion listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,389,074, Reexam. No. 90/001,900, Requested Dec. 6, 1989, Cl. 299/079, MINE TOOLS UTILIZING COPPER MAGANESE NICKEL BRAZING ALLOY, Mark S. Greenfield, Owner of Record: *GTE Products Corp., Danvers, Mass.*, Attorney or Agent: Unknown, Ex. Gp.: 320, Requester: Kennametal. Inc., Latrobe, Pa.

4,518,654, Reexam. No. 90/001,898, Requested Nov. 27, 1989, Cl. 428/331, ONE-SIDED CLING STRETCH WRAP, George N. Eichbauer, et al., Owner of Record: *Mobil Corp., Fairfax, Va.*, Attorney or Agent: James P. O'Sullivan, Ex. Gp.: 150, Requester: Owner

4,677,345, Reexam. No. 90/001,899, Requested Dec. 4, 1989, Cl. 315/209, INVERTER CIRCUITS, Ole K. Nilssen, Owner of Record: *Inventor, Barrington, Ill.*, Attorney or Agent: None, Ex. Gp.: 315/209, Requester: Motorola Lighting Inc., Buffalo Grove, Ill.

4,768,783, Reexam. No. 90/001,896, Requested Nov. 17, 1989, Cl. 272/122, APPARATUS FOR THE REHABILITATION OF DAMAGED LIMBS, John Engalitcheff, Jr., Owner of Record: *Baltimore Therapeutic Equipment Co., Hanover, Md.*, Attorney or Agent: James J. Brown, Ex. Gp.: 330, Requester: Owner

4,828,787, Reexam. No. 90/001,897, Requested Nov. 20, 1989, Cl. 376/245, APPARATUS FOR SIMULATION OF THE OPERATION OF A PRESSURIZED WATER NUCLEAR REACTOR, Klaus Distler, et al., Owner of Record: *Rheinisch-Westfalisches Elektrizitatswerk Essen, Fed. Rep. of Germany*, Attorney or Agent: Karl F. Ross, Ex. Gp.: 220, Requester: The Babcock & Wilcox Co., New Orleans, La.

Patents Available for Licence or Sale

4,367,652, Bernard L. Kleinke, 101 West Broadway, Suite 1580 San Diego, Calif. 92101

4,413,419, Bernard L. Kleinke, Laff, Whitesel, Conte & Saret, 101 West Broadway, Suite 1580, San Diego, Calif. 92101

4,482,939, Directionally Variable Lighting Assembly, Andrew Tishman, 170 East Street, New York, N. Y. 10128 #8B

4,702,704, Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, 301 N. Washington, Falls Church, Va. 22046

4,852,930, Lois Agee, 2922 Gulf of Mexico Drive, Longboat Key, Fla. 34228

December 15, 1989

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to Director, Office of Enrollment and Discipline on or before February 9, 1990:

Boucher, Oliver V. A., 4840 Rue Jeanne Mance, Montreal, Que., H2V 4J7, Canada
Bryant, Kyle S., 5441 Fenmore Rd., Indianapolis, Ind. 46208
Downard, Rita E., 1937 McKelvey Hill Dr., St. Louis, Mo. 64043
Hayes, Lorenzo B., 4729 Queens Chapel Terrace, N. E., Washington, D. C. 20017
Hennon, Paul J., 130 Pleasant St., Vienna, Va. 22180
Huff, Richard L., 19304 Olney Mill Rd., Olney, Md. 20832
Hughes, Neil H., 6267 Atherly Crescent, Mississauga, Ont., L5N 2J1, Canada
Kellogg, Arthur D., 12419 Kembridge Dr., Bowie, Md. 20715
Knight, Anthony, 5718 Gladden Court, Franconia, Va. 22303
Mills, Catherine L., 8904 Clewiston Pl., Gaithersburg, Md. 20879
Pieprz, William, 1435 Crestridge Dr., Silver Spring, Md. 20910
Salindong, Theodore C., 8380 Greensboro Dr., #416, McLean, Va. 22102
Tarcza, John E., 2008 Lanadowne Way, Silver Spring, Md. 20910
Testardi, David A., 7230 Pimmit Court, Falls Court, Va. 22043
White, Robert F., 303 Princeton Blvd., Alexandria, Va. 22314
Williamson, Mark A., 1323 S. Pollard St., Arlington, Va. 22202

December 12, 1989

CAMERON WEIFFENBACH
Director of Enrollment and Discipline

REMOVAL FROM REGISTER

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on November 7, 1989, to Mr. Edmund F. Bard III, at 6565 West Loop South, Suite 710, Houston, Tex. 77401, the last post office address furnished by him to the Office of Enrollment and Discipline. The letter was returned marked: "Forwarding Time Expired".

Accordingly, his name is being removed from the Register of Attorneys and Agents.

December 12, 1989

CAMERON WEIFFENBACH
Director
Office of Enrollment and Discipline

NOTICE OF PUBLIC REPRIMAND

Gerald P. Dundas of Grosse Pointe Shores, Michigan, whose registration number is 22,161, has been reprimanded for professional misconduct. This action is taken under provisions of 35 U.S.C. 32, and 37 CFR 10.130 and 10.133(g).

October 24, 1989

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline
December 12, 1989

NOTICE OF PUBLIC REPRIMAND

David F. Gould of Bangor, Maine, whose registration number is 21,029, has been publically reprimanded. This action is taken under the provisions of 35 U.S.C. 32, and 37 CFR 10.130 and 10.133(g).

October 24, 1989

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline
December 12, 1989

APPEALS TO THE FEDERAL CIRCUIT

Patent applicants should designate as appellants all named inventors in any notice of appeal to the U. S. Court of Appeals for the Federal Circuit when appealing a decision of the Board of Patent Appeals and Interferences.

In a recent unpublished opinion in *In re Deckert*, Appeal No. 89-1386 (Fed. Cir. Nov. 29, 1989), the Federal Circuit notes:

> Deckert's co-inventors Couble and Bonnetti are not parties to this appeal because they were not specifically named in the notice of appeal. Fed. R. App. P. 15(a). *See Torres* v. *Oakland Scavenger Co.*, 108 S. Ct. 2405, 2409 (1988) (construing similiar requirement of Fed. R. App. P. 3(c)).

December 14, 1989

FRED E. McKELVEY
Solicitor

Number of Demands for International Preliminary Examination filed by U. S. Applicants with the European Patent Office as an International Preliminary Examining Authority (IPEA/EP) as of November 30, 1989

Pursuant to the Memorandum of Understanding between the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO) concerning monitoring the number of Demands submitted to the IEPA/EP by U. S. applicants published in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987, the number of Demands filed in the IPEA/EP by U. S. applicants who filed their international applications with the USPTO in its capacity as a Receiving Office as of November 30, 1989 was **330**.

The Memorandum of Understanding between the EPO and the USPTO limits the number of Demands filed by U. S. applicants to 500 for the period of July 1, 1989 to June 30, 1990. The 500 limit is expected to be reached by the end of February 1990. Any Demands filed with the IPEA/EP after the limit of 500 has been reached will be forwarded to the USPTO for processing. Accordingly, applicants should file their Demands directly with the USPTO after the 500 limit has been reached.

The agreement calls for 500 Demands for International Preliminary Examination to be accepted by the IPEA/EP where the International Search Report has been prepared by the EPO between July 1, 1989 and June 30, 1990. The current agreement ends on June 30, 1990.

December 7, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

Questions and Answers

I. New Trademark Application Filing Requirements

The Trademark Law Revision Act of 1988, which was implemented on Nov. 16, 1989, contains the most significant amendments to the Lanham Act since its enactment in 1947. The Patent and Trademark Office has significantly revised the Trademark Rules of Practice to reflect the changes in the law. Additionally, the PTO has issued a supplement to Revision 7 of the *Trademark Manual of Examining Procedure* that reflects the changes in the law, rules, and Office policy and is available from the Government Printing Office.

The PTO's Office of the Assistant Commissioner for Trademarks has prepared a series of "Questions and Answers" about Office practice under the new law and rules. This first in the series concerns the requirements for the initial filing of an application. Subsequent "Questions and Answers" will address various examination issues, the statement of use, requests for extension of time to file the statement of use, the amendment to allege use and notice of allowance.

Q. What is an intent-to-use application?

A. The Trademark Law Revision Act of 1988 became effective on Nov. 16, 1989. It amended the Trademark Act to add a new basis for filing an application for Federal trademark registration on the Principal Register. A party with a bona fide intention to use a specific mark in commerce in relation to specific goods or services may now file an application. However, before the mark will be registered, the applicant must use the mark in commerce in connection with the specified goods or services and submit specimens evidencing use and a verified allegation concerning that use.

First, an intent-to-use application will be examined in relation to all substantive and procedural requirements, except use-related issues, and, if acceptable, published for opposition. If there is no opposition, or any opposition is resolved in the applicant's favor, the applicant will receive a notice of allowance.

The applicant must submit a statement of use within six months of that date, or request a six-month extension of time. The applicant may then request up to four additional six-month extensions of time in which to file the statement of use. The grant of such extensions is predicated, in part, upon the applicant's showing of "good cause" as to why the mark has not yet been used. Thus, an applicant may have up to 36 months from the mailing of the notice of allowance within which to file a statement of use. (See Trademark Rules 2.88 and 2.89 concerning the requirements for a statement of use and extension requests.) Upon filing, the statement of use will be examined and, if accepted, the mark will register.

Q. How does an intent-to-use application differ from an application based upon use in commerce?

A. The primary difference between the two types of applications is the basis for filing. Because of that difference, the filing requirements and processing of the two types of applications differ.

A party may not file an application based upon use of a mark in commerce until after that use has occured. Instead of asserting a bona fide intent to use the mark in commerce, the use-based application must include allegations concerning dates of use and specimens evidencing use as a filing requirement. The use-based application will be examined and, if acceptable, published for opposition. If the mark is not opposed, or any opposition is resolved in the applicant's favor, the mark will register. This procedure differs from the application procedure for an intent-to-use application, as noted above.

However, in all other respects the legal reasons for refusing registration (such as descriptiveness, likelihood of confusion, etc.) and the procedural requirements (such as specificity of identifications of goods, signature by applicant, etc.) are exactly the same for the two types of applications. Additionally, upon registration, the filing date of any application on the Principal Register is a constructive date of first use of the mark.

Q. What are the requirements for filing an intent-to-use application?

A. A complete intent-to-use application consists of a written application, a drawing of the mark, and the required filing fee for each class of goods. The requirements for a written intent-to-use application are set forth in Trademark Rule 2.33. The application must be made to the Commissioner of Patents and Trademarks, must include a request for registration, and must be signed and verified (sworn to) by the applicant.

The application must specify: the name and address of the applicant; information about the applicant's legal entity; a claim that the applicant has a bona fide intention to use the mark in commerce; the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark; the class of goods or services according to the official classification, if known to the applicant; and the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

The applicant must sign a verfication of the application which includes, in part, averments that the applicant is believed to be entitled to use the mark sought to be registered; that to the best of the declarant's knowledge and belief no other entity has the right to use the mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; and that the facts set forth in the application are true.

Please note that Rule 2.33 differs form section 1(b) of the Act because the rule requires the above verification to include a statement that "the applicant is the owner of the mark" rather than that "the applicant believes it is entitled to use the mark." This specific requirement of the rule should be disregarded to the extent that it differs from the statute. The rule will be amended in due course.

Q. What are the minimum requirements for receipt of a filing date for an intent-to-use application?

A. Trademark Rule 2.21 sets forth the minimum requirements for receipt of a filing date for intent-to-use applications, as well as other types of applications. These minimum formal requirements do not include all of the requirements which may ultimately be necessary to obtain registration, but merely those which must be satisfied to receive a filing date.

An intent-to-use application must include the following elements in order to receive a filing date: the name of the applicant, the name and address to which communications can be directed, a drawing of the mark substantially meeting all of the requirements of Trademark Rule 2.52, an identification of goods or services, *a claim of a bona fide intention to use the mark in commerce*, a verification or declaration under Trademark Rule 2.33(b) *signed by the applicant*, and the required filing fee for at least one class of goods or services. If an application lacks any one of these elements, it will be denied a filing date and all papers will be returned to the applicant as informal.

Q. Is there any change in the requirements for applications based upon either use in commerce or Section 44 of the Trademark Act?

A. Yes. Effective Nov. 16, 1989, an application *must* be signed in order to receive a filing date. Trademark Rule 2.21 has been amended to require that an application include a verification or declaration in accordance with Trademark Rule 2.33(b), signed by the applicant, to receive a filing date. This requirement applies to *all* applications filed after Nov. 16, 1989, regardless of the basis for filing. Unsigned applications will be returned to the applicant as informal. A verified assertion, signed by the applicant, of the basis for filing, is believed to be essential because of the importance of the filing date as a constructive date of first use of the mark for registration of the Principal Register.

All other filing requirements for use-based applications remain unchanged.

Concerning Section 44 which permits, under certain circumstances, the filing of an application in the United States based upon an application or registration in another country, there are two additional changes. Effective Nov. 16, 1989, an application filed under Section 44(d) or Section 44(e) of the Trademark Act must include an allegation that the applicant has a bona fide intention to use the mark in commerce. However, Section 44 applicants will still be exempt from any use requirement as a condition to registration. In other words, Section 44 applicants are not required to file specimens evidencing use of the mark or an allegation of use in order to obtain registration.

As a requirement for obtaining a filing date, an application filed pursuant to Section 44(d) must include in the heading of the drawing the date of the foreign filing which forms the basis of its priority claim.

Q. Who can sign an application?

A. There are two issues that may arise with respect to the signature on an application: (1) whether the signature is sufficient for receipt of a filing date, and (2) whether the signature is that of the applicant.

The following persons can properly sign an application for an applicant: an individual applicant, a general partner of a partnership, or an officer of a corporation or association.

If an application is signed by an improper party, but the improper party had "color of authority" to act for applicant, the Office will require re-execution of the application, but will not invalidate the filing date. (See Trademark Rule 2.71(c) concerning "color of authority.") The Examining Attorney will determine whether the signatory had color of authority to sign the application for the applicant. A person has such color of authority if he or she has firsthand knowledge of the relevant facts *and* implied or actual authority to act on behalf of the applicant. A general manager may qualify under this standard. *The applicant's attorney will not ordinarily be regarded as possessing color of authority to sign on behalf of a client.* Attorneys, who are not employees of a corporate applicant, do not usually have firsthand knowledge of a client's business or the authority to act on behalf of a client, other than as legal representative.

If the signature is acceptable for the purpose of receiving a filing date (i.e., if the signatory had color of authority), but is not the signature of the applicant, a substitute verification by the applicant of the facts in the application will be required. If the person who signed did not have even color of authority, the Examining Attorney will refuse registration because the applicant did not meet the minimum requirements of Rule 2.21 for receipt of a filing date. An application signed by a party without color of authority is *void ab initio* and cannot be corrected by submission of a substitute declaration.

Q. Are "fax" copies of signatures acceptable?

A. The Trademark Operation does not have the equipment to accept documents transmitted by "fax" for purposes of receiving a filing date. However, the signature on a properly filed application may be a photocopy or "fax" copy of the original signature. The subsequent submission of the original document will be required by the Examining Attorney.

Q. What is the significance of the filing date?

A. Section 7 of the Trademark Act has been amended to provide that the filing date of an application of the Principal Register is a constructive date of first use of the mark in commerce, provided the application matures into a registration. Thus, filing affords the applicant nationwide priority over others, with the exception of parties who had used the mark before the applicant's filing date, parties who had filed before the applicant, or parties who are entitled to an earlier priority filing date based upon the filing of a foreign application under Section 44(d) of the Trademark Act.

Q. Can an application be based upon both use and intent-to-use?

A. No. Section 1(a) of the Trademark provides for the filing of applications based upon actual use in commerce, while Section 1(b) provides for the filing of applications based upon intent-to-use. Trademark Rule 2.33(d) states that an applicant may not file under both Sections 1(a) and 1(b) of the Act in a single application, nor may an applicant in an application under Section 1(a) of the Act amend to seek registration under Section 1(b). Any application filed under both Sections 1(a) and 1(b) of the Trademark Act will be denied a filing date and returned to the applicant.

Q. Can an applicant assert both a Section 44 claim and an intent-to-use or use claim in the same application?

A. Yes. Section 44(d) provides for applications based upon an application for registration filed in an applicant's country of

origin, and section 44(e) provides for applications based upon a registration in applicant's country of origin. An application may be based upon both a foreign application or registration under Section 44 and *either* use in commerce under Section 1(a) *or* intent-to-use under Section 1(b).

Q. Since a Section 44 application contains a statement of a bona fide intent to use the mark in commerce, isn't this also an intent-to-use application?

A. No. The statement of a bona fide intent to use a mark is one of the statutory requirements for a Section 44 filing and the PTO will not consider the mere inclusion of such a statement to constitute the assertion of a basis for filing under Section 1(b) of the Act. In other words, once the requirements for Section 44 are met and the application successfully completes the opposition period, the mark will register (rather than a notice of allowance issuing in the application).

A Section 44 applicant may *also* assert an intent-to-use basis by explicitly stating, after its statement of a bona fide intent to use the mark in commerce, that it is also asserting a Section 1(b) basis for filing.

Q. Can an intent-to-use application be filed on the Supplemental Register?

A. No. An intent-to-use application initially filed on the Supplemental Register will be denied a filing date and returned to the applicant. No amendment of an intent-to-use application to the Supplemental Register will be accepted until after use has commenced and after the filing and acceptance of an amendment to allege use or a statement of use. In such a case, the effective filing date of the application will be changed to the date on which the applicant filed the amendment to allege use under Section 1(c) of the Trademark Act or the statement of use under Section 1(d) of the Act.

Q. Must an intent-to-use applicant begin using the mark before a registration will issue?

A. Yes. An intent-to-use application may not mature into a registration until use of the mark has begun. After use begins, the applicant must verify such use in either (1) an amendment to allege use or (2) a statement of use. In addition, applicant must submit specimens evidencing use and a fee of $100 per class of goods or services in the application.

Q. What is the difference between an amendment to allege use and a statement of use?

A. The primary difference between the amendment to allege use and the statement of use is the time of filing. The amendment to allege use may be filed during initial examination of the application, i.e., after the filing date of the application and before the date on which the Examining Attorney approves the mark for publication. If the amendment to allege use is accepted, the application will then be processed for publication and issuance in the same manner as a use-based application.

If no amendment to allege use is filed before the Examining Attorney approves the mark for publication, the mark will be published for opposition. After the successful completion of the opposition period, the PTO will issue a notice of allowance. The applicant will then have six months from the date of the notice of allowance in which it must file a statement of use, or file a written request for an extension of time in which to file the statement of use. Successive extensions of time, aggregating no more than 36 months from the notice of allowance, may be obtained pursuant to Trademark Rule 2.89.

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Nov. 27, 1989

PATENT NOTICES

Certificates of Correction For Week of January 9, 1990

Re. 32,897	4,800,289	4,816,499	4,825,875
4,373,195	4,800,669	4,816,920	4,825,901
4,536,026	4,800,811	4,816,953	4,826,034
4,540,432	4,802,171	4,817,760	4,826,119
4,571,925	4,802,973	4,817,787	4,826,405
4,651,428	4,803,215	4,817,788	4,826,474
4,674,841	4,803,503	4,818,052	4,826,486
4,694,593	4,804,655	4,818,103	4,826,616
4,695,351	4,804,675	4,818,144	4,826,640
4,695,673	4,804,789	4,819,490	4,826,649
4,698,920	4,804,895	4,819,566	4,826,705
4,707,754	4,805,085	4,819,617	4,826,762
4,708,494	4,805,162	4,819,952	4,826,955
4,708,794	4,805,940	4,820,077	4,827,021
4,715,565	4,806,528	4,820,235	4,827,031
4,740,487	4,806,661	4,820,283	4,827,280
4,745,895	4,807,303	4,821,736	4,827,779
4,757,935	4,807,470	4,821,845	4,827,854
4,761,939	4,808,420	4,822,208	4,828,712
4,769,341	4,808,441	4,822,237	4,828,771
4,769,673	4,809,137	4,822,257	4,828,888
4,773,078	4,809,623	4,822,511	4,830,835
4,778,796	4,809,667	4,822,527	4,830,996
4,780,871	4,809,762	4,822,647	4,831,189
4,784,087	4,810,364	4,823,198	4,831,340
4,785,806	4,811,293	4,823,660	4,831,459
4,786,719	4,812,407	4,824,025	4,831,550
4,787,567	4,812,527	4,824,228	4,831,677
4,788,596	4,813,225	4,824,422	4,831,921
4,789,545	4,814,833	4,824,453	4,831,966
4,790,531	4,814,902	4,824,783	4,831,997
4,791,290	4,815,255	4,824,811	4,832,344
4,794,073	4,815,734	4,824,839	4,833,090
4,795,747	4,815,854	4,824,985	4,833,225
4,795,830	4,816,131	4,825,482	4,835,673
4,796,488	4,816,162	4,825,526	4,836,947
4,798,443	4,816,174	4,825,567	4,841,871
4,798,539	4,816,256	4,825,628	4,848,726
4,799,565	4,816,438	4,825,748	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 200	Mail relating to PTO Bicentennial Celebration.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
Box ITU	All Intent to Use documents excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
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Oregon	Salem: Oregon State University	(503) 378-4239
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	Pittsburgh, Carnegie Library of	(412) 622-3138
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Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF November 18, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director 5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director 6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director 4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director 5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director 1-28-87

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director 10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director 2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director 11-16-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director 6-7-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director 8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director 9-21-87
DESIGN, GROUP 290—K. L. CAGE, Director 2-6-86

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director 4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director 1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director 2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director 1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during November 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,702,012 to 3,704,468 inclusive
Plant Patents ..... None

REEXAMINATIONS

JANUARY 9, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,598,675 (1181st)
METHOD FOR SECURING STRIP MEMBERS TO CONTAINER BODIES
Karl Bofinger, Cincinnati, Ohio, and Walter T. Hake, Wyckoff, N.J., assignors to American National Can Company
Reexamination Request No. 90/001,543, Jun. 22, 1988.
Reexamination Certificate for Patent No. 3,598,675, issued Aug. 10, 1971, Ser. No. 595,809, Nov. 21, 1966.
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—172

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3**, **12** and **13** is confirmed.

Claims **1**, **2** and **4–11** are cancelled.

[1. The method of securing a strip member to a tubular body member, one of the members having an adhesive thereon so as to adhere to the other member upon contact therewith, comprising the steps of:

moving the body member along a first fixed path of revolution;

simultaneously rotating said member about its own axis as said member moves along said first path;

simultaneously moving the strip member along a second fixed path of revolution, tangential to said first path; and

contacting only a leading portion of the strip member to the rotating body member when said leading portion and the rotating body member are substantially tangential so that said leading portion adheres to the body member, said body member movement along said first path and rotation about its own axis subsequent to said contacting between said members causing the strip member to leave said second path and the remaining portion of the strip member to adhere around the tubular body member.]

3. The method of securing a strip member to a tubular body member according to claim 1 wherein the sum of the speed of revolution of the body member and the speed of rotation of said member about its own axis is substantially equal to the speed of revolution of the strip member.

B1 3,931,011 (1182nd)
FLUID SEPARATION APPARATUS
Mark S. Richards, and Shannon B. Copeland, both of Modesto, Calif., assignors to Parker-Hannifin Corporation
Reexamination Request No. 90/001,632, Nov. 4, 1988.
Reexamination Certificate for Patent No. 3,931,011, issued Jan. 6, 1976, Ser. No. 417,225, Nov. 19, 1973.
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—136

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. Apparatus for separating low density fluid from high density fluid and particles comprising:

a. a fluid impervious hollow elongated chamber closed at one end by cup means;

b. a fluid inlet passage extending into said chamber intermediate the ends thereof and having a tubular portion with a free end extending toward said cup means along the axis of elongation of said chamber;

c. a fluid impervious funnel member surrounding said tubular portion of said inlet passage in close spaced relation to the outer surface thereof, the apex of said funnel member extending toward said cup member and the outer periphery of said funnel member forming a fluid-tight annular joint with the inner wall of said chamber;

d. a deflector turbine means mounted at the free end of said tubular portion of said inlet passage to receive fluid from said inlet passage and urge said fluid to move in generally annular paths about the axis of elongation of said chamber, said deflector turbine means including a frusto-conical fluid impervious surface spaced from the free end of said tubular portion of said inlet passage having helical flutes therein and extending across said chamber with the apex thereof adjacent said free end of said tubular portion of said inlet passage and the periphery of the base thereof in close spaced relation to the inner surface of said chamber, said periphery of the base of said frusto-conical fluid impervious surface having a plurality of protuberances spaced from each other thereabout with each of said protuberances being located between a different pair of flutes on said frusto-conical surface and extending into contact with the inner surface of said chamber, and a frusto-conical member having an aperture at its apex communicating with said free end of said tubular portion of said inlet passage and having an inner frusto-conical surface mating with said fluted frusto-conical fluid impervious surface in close spaced relation thereto and an outer frusto-conical surface substantially parallel to said inner frusto-conical surface;

e. an outlet passage extending out of said chamber intermediate its ends and having a tubular portion extending away from said cup means along the axis of elongation of said chamber;

f. a tubular filter element more pervious to said low density fluid than said high density fluid surrounding said tubular portion of said outlet passage in spaced relation thereto, the outer surface of said tubular filter element being spaced from the inner surface of said chamber;

g. fluid impervious wall means extending outwardly from the outer surface of said tubular portion of said outlet passage and across the inner end of said tubular filter element, said wall means forming fluid-tight joints with said outer surface of said tubular portion of said outlet passage and with the inner end of said tubular filter element and having its outer periphery in close spaced relation to the inner surface of said chamber; and

h. fluid impervious cap means closing the other end of said chamber.

B1 4,120,845 (1183rd)
SULFIDE CONTAINING STABILIZERS
Thomas G. Kugele, Cincinnati, Ohio, assignor to Morton Thiokol Inc.
Reexamination Request No. 90/001,535, Jun. 21, 1988.
Reexamination Certificate for Patent No. 4,120,845, issued Oct. 17, 1978, Ser. No. 826,917, Aug. 22, 1977.
Division of Ser. No. 492,969, Jul. 26, 1974, Pat. No. 4,062,881.
Int. Cl.[4] C08K *5/58*
U.S. Cl. 524—181

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 57 is confirmed.

1. A halogen containing vinyl of vinylidene polymer composition containing a monoorganotin or diorganotin mercaptoalkyl ester of a carboxylic acid or mercapto hydroxyalkyl ester of a carboxylic acid mono or polysulfide useful as a stabilizer for improving the resistance to deterioration of vinyl chloride polymers when heated at 350° F. containing at least one tin atom having one to two hydrocarbyl groups having from 1 to 20 carbon atoms and selected from the group consisting of alkyl, aryl, cycloalkyl, aralkyl and alkenyl and linked to the tin through carbon, at least one mercaptoalkyl ester of a carboxylic acid group linked to tin through the sulfur of the mercaptoalkyl group and at least one mono or polysulfide sulfur group bonded exclusively to tin, the organotin compound having an amount of tin within the range from 10 to 42% by weight and an amount of sulfur within the range from 8 to 42% by weight.

B1 4,391,705 (1184th)

BALLASTING DIGESTOR COVERS

Lynn W. Cook, Fruit Heights, and David P. Brown, Salt Lake City, both of Utah, assignors to Envirotech Corporation

Reexamination Request No. 90/001,650, Nov. 26, 1988.
Reexamination Certificate for Patent No. 4,391,705, issued Jul. 5, 1983, Ser. No. 268,214, May 29, 1981.
Int. Cl.[4] C02F *11/04*
U.S. Cl. 210—218

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 is confirmed.

1. An apparatus for digesting sludge comprising: a cylindrical tank, a cover adapted to move upwardly and downwardly within the tank, with the cover having an upright cylindrical sidewall the lower end thereof adapted to project into the sludge to form a gas-tight seal therewith and with gas being stored under the cover above the surface level of the sludge, a gas outlet at the upper end of the cover, valve means communicating with said outlet for regulating flow of gas from under the cover, a plurality of separate ballast members mounted to the interior of said sidewall near the lower end thereof, at least some of the ballast members each having a cavity formed in the upper end thereof that extends downwardly into the ballast member so that the cavity will fill with sludge upon flow of sludge into the tank and that is adapted to hold a predetermined substantial quantity of sludge therein, whereby when the volume of gas accumulated under the cover is sufficient to lift said ballast members partially from the sludge the predetermined total quantity of sludge within the ballast members effectively increases the total ballasting weight of the ballast members by a substantial predetermined amount over the ballasting weight of the members when they are not filled with sludge.

B1 4,438,217 (1185th)

CATALYST FOR OXIDATION OF PROPYLENE

Mashiro Takata; Ryuji Aoki, and Takahisa Sato, all of Himeji, Japan, assignors to Nippon Shokubai Kagak Kogyo Co., Ltd., Osaka, Japan

Reexamination Request No. 90/001,677, Dec. 22, 1988.
Reexamination Certificate for Patent No. 4,438,217, issued Mar. 20, 1984, Ser. No. 454,611, Dec. 30, 1982.
Claims priority, application Japan, Jan. 6, 1982, 57-406
Int. Cl.[4] B01J *21/08, 23/78, 23/84, 23/88*
U.S. Cl. 502—205

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 is confirmed.

New claims 4–7 are added and determined to be patentable.

1. A catalyst for the oxidation of propylene, said catalyst having the composition represented by the following formula

$$Mo_aW_bBi_cFe_dA_eB_fC_gD_hO_x$$

wherein

A represents at least one element selected from the group consisting of nickel and cobalt,

B represents at least one element selected from the group consisting of alkali metals, alkaline earth metals and thallium,

C represents at least one element selected from the group consisting of phosphorus, arsenic, boron and niobium,

D represents at least one element selected from the group consisting of silicon, aluminum and titanium,

a, b, c, d, e, f, g, h, and x respectively represent the atomic ratios of Mo, W, Bi, Fe, A, B, C, D, and O,

a is from 2 to 12

b is from 0 to 10,

the sum of a and b is 12,

c is from 0.1 to 10.0,

d is from 0.1 to 10.0,

e is from 2 to 20,

f is from 0.005 to 3.0,

g is from 0 to 4,

h is from 0.5 to 15 and

X is a number determined by the atomic valences of the individual elements,

and being molded in the shape of a hollow cylinder having an outside diameter of 3.0 to 10.0 mm, an inside diameter 0.1 to 0.7 times the outside diameter and a length 0.5 to 2.0 times the outside diameter.

REISSUES

JANUARY 9, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,142
CENTRIFUGAL COMPRESSOR

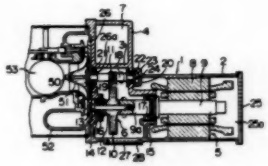
Kazuo Sato, Kitaibaraki; Michiaki Ida; Masatosi Terasaki, both of Shimoinayoshi; Masaki Kurimoto, Kashiwa, and Shigeo Sugimoto, Ushikumachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,743,174, dated May 10, 1988, Ser. No. 907,132, Sep. 12, 1986. Continuation of Ser. No. 789,019, Oct. 18, 1985, abandoned. Application for reissue Mar. 31, 1989, Ser. No. 331,294

Claims priority, application Japan, Oct. 19, 1984, 59-218316

Int. Cl.[4] F04B *17/00, 35/00*

U.S. Cl. 417—365 2 Claims



1. A centrifugal compressor comprising:

a drive motor accommodated in a motor casing frame section and comprising a stator and a rotor;

a multiplying gear mechanism accommodated in a gear casing frame section and comprising a multiplying gear and a pinion meshing with said multiplying gear, said multiplying gear mechanism being connected at an input side thereof with said drive motor;

an impeller connected with said multiplying gear mechanism;

a rotor shaft for mounting said rotor in said motor casing frame section rotatably supported by a single bearing mounted on said gear casing frame section and extended into said gear casing frame section;

a gear shaft for mounting said multiplying gear rotatably supported at one end thereof by another single bearing mounted on said gear casing frame section opposite to said first mentioned bearing, said gear shaft and said rotor shaft being directly coupled with each other between said multiplying gear and said first-mentioned bearing to constitute a first shaft;

a second shaft for mounting said pinion rotatably supported at both ends thereof by bearings mounted on said gear casing frame section;

a side opening for said drive motor provided at said motor casing frame section;

a side plate for sealingly closing said opening;

a further side opening for said pinion provided on said gear casing frame section;

a further side plate for sealingly closing said further opening;

an access opening for said multiplying gear provided on said gear casing frame section; and

a closure plate for sealingly closing said access opening; and

wherein said motor casing frame section is integrally formed with said gear casing frame section.

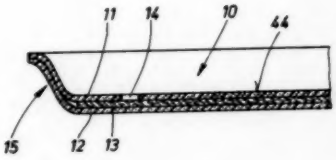
Re. 33,143
TRAY FOR RECEIVING FOODSTUFFS AND A PROCESS AND APPARATUS FOR PRODUCING IT

Horst-Ditmar Gröne, Schwanewede, Fed. Rep. of Germany, assignor to Lin Tec Verpackungstechnik GmbH, Fed. Rep. of Germany

Original No. 4,702,377, dated Oct. 27, 1987, Ser. No. 799,707, Nov. 19, 1985. Application for reissue Mar. 31, 1989, Ser. No. 332,226

Int. Cl.[4] B65D *1/34, 6/04*

U.S. Cl. 206—557 5 Claims



1. Tray for receiving liquid-secreting foodstuffs and delicacies, for example meat, fish or poultry, and having a basic tray body having a length and a width and consisting of liquid-tight plastic and an absorbent insert, characterised in that the basic body consists of two layers (11, 12) of liquid-tight plastic between which is [embedded] *disposed*, centrally relative to a longitudinal plane between the layers, a liquid-absorbent insert (13), in that the upper layer (11) pointing towards the foodstuff has orifices (14), in that the insert (13) is strip-shaped with a smaller width than said two layers and extends over only a limited region of the tray, so that outside the region of the insert (13) the two layers (11, 12) are in direct contact with one another, in that said basic body has a bottom wall (44), in that the insert extends over the entire length of the two layers (11, 12), and in that the width of the insert (13) corresponds approximately to the width dimension of the bottom wall (44).

Re. 33,144
VEHICLE WHEEL ALIGNMENT APPARATUS

Lee Hunter, Creve Coeur, and Daniel B. January, Bel-Ridge, both of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Original No. 43,021,047, dated Nov. 24, 1981, Ser. No. 81,102, Oct. 2, 1979. Application for reissue Nov. 22, 1982, Ser. No. 443,381

Int. Cl.[4] G01B *11/26, 5/24*

U.S. Cl. 356—152 6 Claims

1. In apparatus for determining the alignment positions of vehicle wheels in relation to a reference axis of the vehicle and to the thrust line of the non-steerable wheels, the improvement which comprises:

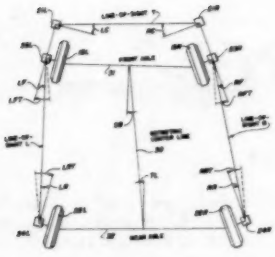
(a) first alignment determining instruments carried by each of a set of steerable wheels so as to be in a substantially vertical plane containing the axis of rotation of said steerable wheels;

(b) second alignment determining instruments carried by each of a set of non-steerable wheels so as to be in a substantially vertical plane containing the axis of rotation of said non-steerable wheels;

(c) third alignment determining instruments supported from said steerable wheels in position to be in line-of-sight with each other transversely of the vehicle;

(d) radiant energy beam projectors and beam sensors in each

of said first, second and third alignment determining instruments in positions such that the radiant energy beams from first instruments are in the line-of-sight to be sensed by said beam sensors in second instruments, radiant energy beams from second instruments are in the line-of-sight to be sensed by said beam sensors in first instruments, said first and second instruments are arranged in cooperating pairs along opposite longitudinal sides of the vehicle so as to be spaced in the longitudinal direction between said steerable and non-steerable wheels; and



(e) radiant energy beam projectors and beam sensors in said third alignment determining instruments in positions of cooperation transversely of the vehicle adjacent the steerable wheels, whereby said first and third instruments cooperate to generate signals determinative of the alignment positions of the steerable wheels relative to the vehicle reference axis and said second instruments cooperate with said first instruments to generate signals determinative of the thrust line effect of the non-steerable wheel on said steerable wheels.

Re. 33,145

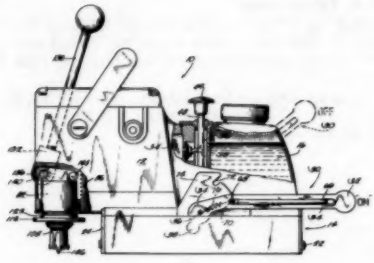
MAGNETIC BASE FOR PORTABLE TOOLS

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Original No. 4,639,170, dated Jan. 27, 1987, Ser. No. 720,899, Apr. 8, 1985. Application for reissue Oct. 19, 1988, Ser. No. 260,178

Int. Cl.[4] B23B *45/14*

U.S. Cl. 408—76 **8 Claims**



1. An electric power tool having a base,

permanent magnet means in said base for holding said base to a ferromagnetic material,

means operative to substantially shunt the magnetic field of said permanent magnet means to permit removal of the tool from the material,

a handle including lever means movable between "on" and "off" positions and connected to said shunt means to cause said shunt means to become operative when the lever means is moved to said "off" position,

a probe mounted in said base for reciprocation between a retracted position and a second position in which it projects from said base,

a spring biasing said probe to its said second position,

[and means interconnecting said probe and said shunt means to prevent movement of said probe from said second position when said shunt means as in said "off" position]

an electric motor mounted on said base,

a switch operable to "on" and "off" to control operation of said motor,

a switch actuator connected to said probe and to said switch,

means carried by said shunt means to prevent actuation of said actuator to operate said switch to "on" unless said probe is in its retracted position and said shunt means is in its "on" position.

PLANT PATENTS

GRANTED JANUARY 9, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,096
ROSE PLANT JACBRO

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 14, 1988, Ser. No. 284,296
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class substantially as herein shown and described, characterized particularly as to novelty by the large apricot and yellow blend flower color, with good fragrance, good bloom production and a large vigorous plant growth.

7,097
IMPATIENS PLANT NAMED NEBULOUS

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 9, 1989, Ser. No. 308,818
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Impatiens plant named Nebulous, as illustrated and described.

7,098
IMPATIENS PLANT NAMED RADIANCE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 9, 1989, Ser. No. 308,817
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Impatiens plant named Radiance, as illustrated and described.

7,099
AFRICAN VIOLET PLANT NAMED LITTLE AQUAMARINE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,756
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Little Aquamarine, as described and illustrated, and particularly characterized by its miniature growth habit; single violet-shaped, white flowers with blue center; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; bright green, spear-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,100
LILY PLANT NAMED AVIGNON

Floris Vletter, Rijnsburg, Netherlands, assignor to Gebr. Vletter & J.A. Den Haan, Netherlands

Filed Oct. 24, 1988, Ser. No. 261,251
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of lily plant named Avignon, substantially as shown and described.

7,101
LILY PLANT NAMED GENEVE

Floris Vletter, Rijnsburg, Netherlands, assignor to Gebr. Vletter & J.A. den Haan, Netherlands

Filed Oct. 24, 1988, Ser. No. 261,253
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of lily plant named Geneve, substantially as shown and described.

7,102
AFRICAN VIOLET PLANT NAMED LITTLE TOURMALINE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,376
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Little Tourmaline, as described and illustrated, and particularly characterized by its miniature growth habit; semi-double, dark pink flowers with elongated petals; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; bright green, heart-to spear-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,103
AFRICAN VIOLET PLANT NAMED LITTLE VIOLET SAPPHIRE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,526
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Little Violet Sapphire, as described and illustrated, and particularly characterized by its miniature growth habit; large, purplish blue, star-shaped flowers with long petals; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; bright green, spear-shaped leaves; Flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,104
AFRICAN VIOLET PLANT NAMED IRENE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,630
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Irene, as described and illustrated, and particularly characterized by its wavy, semi-double, variegated blue and white flowers with frilled edges; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green, round, slightly serrated leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,105
MUSHROOM PLANT, *PLEUROTUS OSTREATUS* KUMMERI

David A. Kummer, 7967 Candlewood Dr., Boise, Id. 83709

Filed Sep. 26, 1988, Ser. No. 249,553
Int. Cl.[4] A01H *15/00*
U.S. Cl. Plt.—89 1 Claim

1. A novel mushroom, *Pleurotus ostreatus* kummeri, substantially as shown and described.

PATENTS

GRANTED JAN. 9, 1990

ERRATA

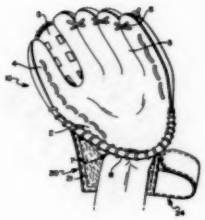
For CLASS	See PATENT NO.
091-399	4,891,864
606-082	4,892,093
606-001	4,892,096
606-018	4,892,098
606-194	4,892,099
439-818	4,892,542
562-021	4,892,679
552-253	4,892,686
426-549	4,892,762
264-065	4,892,848
514-247	4,892,947
514-245	4,892,952
549-229	4,892,954
549-325	4,892,955
388-817	4,893,067
371-022	4,893,072
049-199	4,893,343

PATENTS

GRANTED JANUARY 9, 1990

GENERAL AND MECHANICAL

4,891,845
BASEBALL GLOVES
Rufus Hayes, 18640 Griggs, Detroit, Mich. 48221
Filed Feb. 22, 1988, Ser. No. 158,647
Int. Cl.[4] A63B *71/14;* A41D *13/10*
U.S. Cl. 2—19 **9 Claims**



1. An apparatus for imparting hand, wrist and arm control to a baseball glove having a front or palm wall and a back wall connected thereto to define a thumb portion, a fingers portion, and a lower hand-insertion opening defined in part by a lowermost free edge of the front wall of the glove, comprising:

a substantially bendable support piece adapted to be integrally attached to the back wall of said baseball glove so as to extend a distance, above and below the lowermost free edge of the front wall of said baseball glove, which is sufficient to cover and support at least back portions of a user's hand, wrist and forearm;

a securing strap member extending from a lower portion of said support piece and adapted to encircle a portion of the user's forearm substantially below the user's wrist so as to secure said support piece in position adjacent at least back portions of the user's hand, wrist and forearm; and

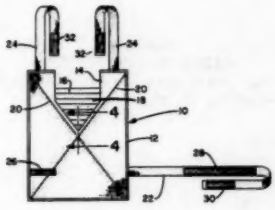
said support piece and said securing strap member operatively cooperating with each other and with said baseball glove to permit flexing of a user's hand and wrist beneath said support piece while said support piece is disposed sufficiently close to the back of the user's hand, wrist and forearm to support same and impart controlling movements from the user's hand, wrist and forearm to said baseball glove.

4,891,846
MEDICAL ABSORPTION GARMENT
Annette M. Sager, 17424 Fulton Rd., Marshallville, Ohio 44645, and Suzette M. Szittai, 185 Marion St., Doylestown, Ohio 44230
Filed Dec. 16, 1988, Ser. No. 285,764
Int. Cl.[4] A41D *1/04;* A41B *13/10*
U.S. Cl. 2—49 R **5 Claims**

1. A medical absorption garment comprising:

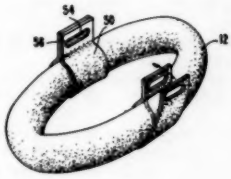
a bib member having upper and lower ends; a torso strap, and upper strapping, wherein said bib member is a laminate comprising at least one absorbent, fibrous inner layer disposed between two outer layers of fabric, said bib member being provided on its upper end with a neck yoke cut from the upper end of said bib member and extending downwardly therefrom, said neck yoke having an attenuated yoke panel adjacent the lower edge of said neck yoke, and said yoke panel comprising at least one absorbent fibrous inner layer disposed between two outer layers of fabric, and means for compressing the thickness of at least a portion of said yoke panel, and

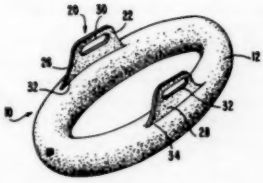
wherein said torso strap extends from one side of said bib, being adapted to encircle the torso of a wearer, and to be temporarily attached to the other side of said bib member, wherein further, said upper strapping extends from the



upper end of said bib member, one from each side of said neck yoke, being adapted to be temporarily attached to said torso strap at the rear of the wearer by a strap fastening means.

4,891,847
METHOD AND APPARATUS FOR REDUCING INCONTINENCE OR PAIN
Glenn R. Baker, and Janet B. G. French, both of 70 Glen Dr., Worthington, Ohio 43085
Continuation of Ser. No. 858,818, May 2, 1986, abandoned. This application Oct. 9, 1987, Ser. No. 106,895
Int. Cl.[4] A61F *5/34, 13/00;* A61G *9/00*
U.S. Cl. 4—239 **12 Claims**





1. A method of using a generally annular cushion for reducing incontinence or pain while moving from a first standing position to a second seated position, said cushion being structurally adapted to be accommodated to the posterior portion of a human, defining an opening therein, and having handles positioned on opposite sides of the opening for removably securing said cushion to the posterior of said human during movement between said first position and said second position, comprising the steps of:

grasping said handles on said cushion by the hands of the human;

moving said cushion into contact with the posterior of said human while continuing to grasp said handles; and

moving between said first position and said second position while continuing to grasp said handles and maintain said cushion in contact with the posterior of said human;

thereby reducing a risk of incontinence and pain during such movement.

4,891,848

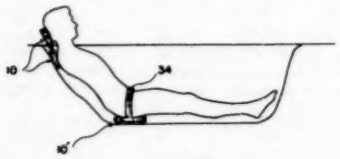
WATERPROOF PILLOW

Tommy L. Carter, 230 E. Alvin Dr. #116, Salinas, Calif. 93906

Filed Jun. 10, 1988, Ser. No. 204,851

Int. Cl.[4] A47K 3/12

U.S. Cl. 4—571 **3 Claims**



1. A pillow assembly comprising an head-shoulder support member and a body support member separate and independent from said head-shoulder support member each comprising:

a first layer constructed of air entrained material;

a second layer constructed of a firm, pliable rubberized material;

said first and second layers being superimposed so that said first layer abuts said second layer defining a boundary substantially centered between said layers, said first and second layers having a plurality of air pockets disposed throughout;

said air pockets substantially equally deployed within said first and second layers;

a waterproof cover enclosing said first and second layers whereby said first and second layers define a floatable unit;

said head-shoulder support member having an uppermost portion sized and shaped to support a user's head and a lowermost portion of sufficient width and length to support a user's shoulders and back;

said uppermost and lowermost portions connected normally to each other to form an inverted T-shaped unit with the uppermost portion connected intermediate of the ends of the lowermost portion;

said independent head-shoulder and body support members each having means for adhering to an adjacent surface, whereby a user may recline thereon; and

hook and loop fastener means attached to said body support member whereby said body support member may be affixed to the body of a user.

4,891,849

HYDROTHERAPY PATIENT SUPPORT APPARATUS

Harry W. Robinson, 8153 West Beard Rd., Perry, Mich. 48872

Continuation of Ser. No. 920,726, Oct. 20, 1986, abandoned, which is a division of Ser. No. 784,780, Oct. 7, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 91,298

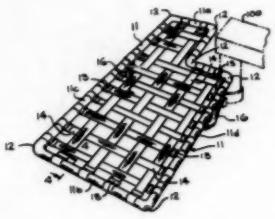
Int. Cl.[4] A47K 3/022

U.S. Cl. 4—575 **8 Claims**

1. A support apparatus for supporting a patient while immersed in a water filled bathtub for treatment of lower back pain which comprises:

(a) frame means with opposed top and bottom rails and opposed side rails positionable at an inclined angle in the bathtub wherein the rails define a single plane and wherein the frame means extends peripherally about the head, back and buttocks of the patient while leaving the legs of the patient unsupported and wherein a portion of the frame means adjacent the head is formed with a recess to allow positioning of a pump in the bathtub with nozzles directed at the back;

(b) flexible webbing stretched across and attached to said frame means for supporting the head, back and buttocks of the patient wherein the webbing is open so as to provide exposure of substantial portions of the back; and



(c) a pair of leg supports mounted on the side rails of said frame means having a curved shape to fit a rounded bottom of the bathtub, wherein the leg supports hold the frame means at the inclined angle adjacent a bottom portion of the bathtub and wherein the bottom rail extends across the rounded bottom of the bathtub enabling circulation of water through the webbing onto the back of the patient and under the bottom rail of the frame means for recirculation.

4,891,850

ARTICULATED SHOWER-BATH SCREEN SHUTTERS FOR A BATH-TUB, A SHOWER RECEIVER AND LIKE TUB

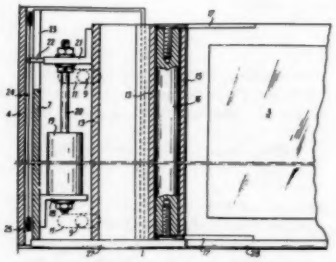
Georges Borstcher, Résidence "Le Trianon", 52 rue des Eveuses, 78120 Rambouillet, France

Continuation of Ser. No. 910,525, Sep. 22, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 143,221

Claims priority, application France, Sep. 25, 1985, 85 14197

Int. Cl.[4] A47K 3/22

U.S. Cl. 4—609 **7 Claims**



1. A pivotally mounted shower shield for a bath tub, shower receiver and like tub, comprising at least on shutter; articulating means for articulating said at least one shutter between two positions at right angle of said bath tub, shower receiver and like tub; guiding means provided on said articulated means for vertically guiding said at least one shutter between an up position and a down position; and shutter weight compensating means for counterbalancing said at least one shutter during movement and in any position between said up position and

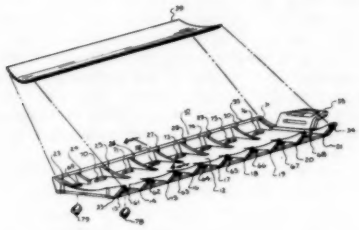
said down position, and wherein the guiding means comprises a guiding profile and a sliding profile with said guiding profile being disposed inside a support profile, and wherein a finger is fixed to said sliding profile and extends through a slot of the guiding profile, said finger being connected to at least one pull cord adapted to be fixed to studs provided on the support profile.

4,891,851

FLEXIBLE PATIENT TRANSFER CRADLE

Thomas J. Sierocuk, New Berlin, and Robert J. Dobberstein, West Allis, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 12, 1983, Ser. No. 560,301
Int. Cl.[4] A61G 7/08
U.S. Cl. 5—81 R **6 Claims**



1. A flexible patient transfer cradle comprising:
an elongate, flexible mounting plate having a plurality of wheels mounted to the underside thereof, said mounting plate being sufficiently flexible to allow said wheels to maintain contact with a rolling surface having irregularities therein to reduce the transmission of undesired vibrations to the patient;
a plurality of support ribs disposed in two rows secured to the upper surface of said mounting plate, said support ribs in each row being positioned transversely and on either side of the longitudinal center line of said mounting plate along substantially the entire length thereof so as to substantially preserve the flexibility of said mounting plate; and
a pair of parallel elongate members substantially coextensive with and disposed laterally on either side of said mounting plate, said elongated members slidably engaging said support ribs to enable longitudinal movement thereof relative to said elongate members, thereby allowing in use said cradle to bend without resistance from the elongate members.

4,891,852

BASSINET ROCKER

Clistheses F. Lopez, Jr., 22503 Meyler St., #27, Torrance, Calif. 90502

Filed Feb. 21, 1989, Ser. No. 312,453
Int. Cl.[4] A47D 9/04
U.S. Cl. 5—105 **12 Claims**

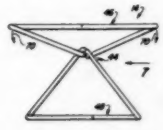
1. An apparatus for holding and rocking a bassinet having a bed including a horizontally disposed bottom surface and legs supporting the bassinet bed, comprising:
a. four spaced apart vertical posts joined together by cross beams to form a vertically disposed structure;
b. four horizontal cross beams each joining a respective two vertical posts adjacent the tops of the posts to thereby form a horizontally disposed planar surface comprised of the four horizontal cross beams supported by the four vertical posts;
c. a pair of spaced apart generally parallel rocker members, each rocker member having an arcuate lower surface, and one rocker member attached adjacent the lowermost portion of two vertical posts and the other rocker member attached adjacent the lowermost portion of the remaining two vertical posts in a manner such that the lowermost arcuate portion of each rocker member lies in the same horizontal plane; and
d. the vertical distance from the lowermost point of the arcuate lower surface of a rocker member to the horizontal plane formed by the four horizontal cross beams is greater than the vertical height of the legs of the bassinet when the bassinet is placed upon the apparatus;
e. whereby the bassinet is placed upon said apparatus such that its horizontally disposed bottom surface rests on and is supported by the four horizontal cross beams such that the legs of the bassinet are raised above the ground to permit the rocker members to rock back and forth when a horizontal rocking force is imparted to the bassinet.

4,891,853

BOX SPRING ASSEMBLY

Upton R. Dabney, Georgetown, Ky., assignor to Hoover Group, Inc., Alphretta, Ga.

Filed Oct. 28, 1988, Ser. No. 264,024
Int. Cl.[4] A47C 23/02
U.S. Cl. 5—247 **6 Claims**



1. A spring for supporting a wire mattress support deck on a frame of a bedding unit;
said spring being formed of a single spring wire member which has a lower portion connectible to the said frame, an upper portion connectible to said wire deck and an intermediate portion connecting said lower portion to said upper portion, said intermediate portion being comprised of a pair of vertically collapsible column sections to support said upper portion resiliently on said lower portion;
said upper portion comprising a generally horizontal plat-

form member having upper transverse torsion bars at its ends;

said lower portion comprising a pair of substantially horizontally disposed mounting feet having lower transverse torsion bars located at the ends of said lower portion;

said column sections each including a middle transverse torsion bar spaced both vertically and horizontally from said upper and lower torsion bars in said upper and lower portions, and connecting bars extending from opposite ends of each of said column section middle torsion bars and being formed integral with said transverse torsion bars in said upper and lower portions;

said middle torsion bars in said column sections being substantially horizontally aligned and spaced apart in the unloaded position of said spring and being movable toward each other in response to vertically collapsible movement of said column sections; and

said column section middle torsion bars being movable into an engaged position during collapse of said column sections so as to thereby limit deflection of said platform toward said lower portion to a position in which said platform is spaced a predetermined distance above said engaged middle torsion bars.

4,891,854

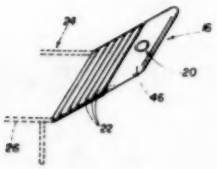
FACE AND HEAD SUPPORT ASSEMBLY FOR USE WITH A LOUNGE CHAIR OR LIKE STRUCTURE

Neal B. Finkelstein, 8565 S.W. 137 Ave., Miami, Fla. 33183

Filed Apr. 10, 1989, Ser. No. 335,754

Int. Cl.[4] A47C *20/02, 17/66*

U.S. Cl. 5—435 **2 Claims**



1. A support assembly designed to support a person's head in a reclining, face-down position and mounted on a lounge chair, said assembly comprising:

(a) a base comprising a front portion and a rear portion disposed in spaced relation to one another and defining a hollow interior, said front and rear portions connected by a closed end of said base and including an open end oppositely disposed to said closed end, said open end and hollow interior being dimensioned to slidingly surround an upper free end of a backrest portion of the lounge chair,

(b) an opening formed in said base and extending therethrough between opposite sides thereof and dimensioned and configured to allow passage of a major portion of the user's face therethrough,

(c) said opening including a peripheral portion disposed substantially continuously along the majority of the length of the peripheral edge thereof and extending outwardly from a surface of said base,

(d) said peripheral portion formed of a cushioning material and disposed in supporting, confronting engagement with the surface of the face and dimensioned to surround the mouth, nose and eyes thereof.

4,891,855

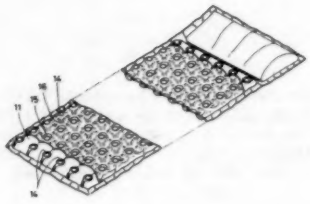
INFLATABLE SUNTANNER WITH SPEEDY AND HOMOGENEOUS SUNTAN EFFECT

Wang Cheng-Chung, Taipei, Taiwan, assignor to Team Worldwide Corporation, Taipei, Taiwan

Filed Nov. 14, 1988, Ser. No. 270,786

Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—449 **5 Claims**



1. An inflatable suntanner comprising an upper transparent layer, a middle reflective layer and a bottom layer each of which is made of a flexible, gas impervious material, said middle layer being bonded to said upper layer at a plurality of upper joints to form an upper gas chamber between said upper layer and said middle layer, and bonded to said bottom layer at a plurality of lower joints to form a lower gas chamber between said middle layer and said bottom layer, characterized in that:

the size of each of said upper joints is different from that of each of said lower joints so as to corrugate those portions of said middle reflective layer interconnecting said upper and lower joints, whereby sunlight passing through said upper transparent layer and incident on said corrugated reflective layer can be irregularly reflected upon the side of the user not exposed to the sun rays so as to expedite a homogeneous suntan.

4,891,856

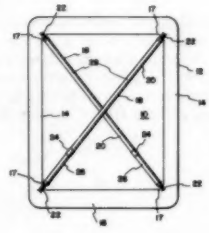
GRASPING SYSTEM FOR USE WITH A CONTOURED SHEET

Maria T. Thornhill, 15 Prospect Dr., Coral Gables, Fla. 33133

Filed Dec. 27, 1988, Ser. No. 290,609

Int. Cl.[4] A47G *9/04*

U.S. Cl. 5—496 **4 Claims**



1. In combination a grasping system comprising a contoured sheet, a mattress and a grasping device for firmly holding said contoured sheet to said mattress, said mattress having a top and bottom portion, sides, end portions and opposed corner portions, said contoured sheet having a bottom portion that underlies the mattress bottom portion, said bottom portion including opposed corner adjacent said mattress corner positions, said grasping device firmly holding said contoured sheet against said top, sides and corner portions of said mattress, said grasping device comprising independent, crisscrossing, adjustable

first and second straps in contact with said mattress bottom and having clips at each end thereof, and wherein clips of said first strap are secured to one pair of opposed contoured sheet corner portions and wherein clips of said second strap are secured to another pair of opposed contoured sheet corner portions whereby the contoured sheet is held tightly against the top and sides of said mattress.

4,891,857

DENTURE CLEANING DEVICE

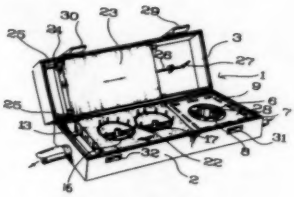
Otto Pinsonneault, P.O. Box 1959, Vernon, Canada V1T 8Z7

Filed Jul. 8, 1988, Ser. No. 216,375

Claims priority, application Canada, Oct. 2, 1985, 492041

Int. Cl.[4] A46B *13/06*

U.S. Cl. 15—21 R **8 Claims**



1. A denture cleaning apparatus comprising a housing having a water inlet and a water outlet, a turbine wheel adapted to be driven by water flowing through the housing, a pair of opposed brush members slidably mounted in the housing, means for receiving dentures between the brush members, and means driven by the turbine wheel for reciprocating the brush members so as to clean dentures located therebetween.

4,891,858

ROADWORKING APPARATUS

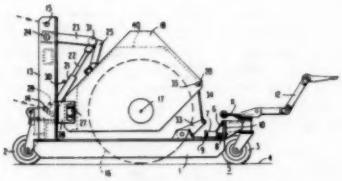
Johann Wachter, Mannsworth, Austria, assignor to Famag Fahrzeug- und Maschinenhandelsgesellschaft m.b.H. Nfg.KG., Vienna, Austria

Filed Mar. 22, 1988, Ser. No. 166,411

Claims priority, application Austria, Mar. 23, 1987, 686/87; Mar. 26, 1987, 744/87-1

Int. Cl.[4] F01H *5/09, 1/02*

U.S. Cl. 15—82 **50 Claims**



1. Apparatus for treating the surface of traffic areas with the aid of a motor-driven roll (16) rotatable about a substantially horizontally extending axis, this roll carrying working elements on its circumference, these elements acting on the surface to be treated, wherein the roll (16) is mounted in a support (18) having an end supported on the frame (1) of the apparatus, this frame being supported on the traffic area by wheels, said support being pivotable about an axis (20) parallel to the axis of rotation (17) of the roll (16), and the other end of said support coupled with at least one servo member (21) resting on the frame (1) of the apparatus, characterized in that the roll (16) is held in the desired vertical position, as regards the traffic area (5) to be treated, with respect to the frame (1) of the apparatus by means of said at least one servo member (21) which is a pressure medium motor that can be acted upon by a pressure medium at a preselectable, constant pressure; that the pressure medium motor serving as the servo member (21) can be supplied with the pressure medium by way of an accumulator for the pressure medium at a preselectable, constant pressure; that the end of the support (18) where the servo member (21) engages is guided to be displaceable upwardly and downwardly along the frame (1) of the apparatus; and that the roll (16) can be tilted about an axis (17) perpendicular to its axis and disposed essentially horizontally.

4,891,859

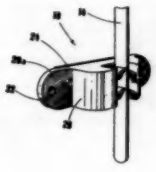
ENGINE OIL DIP STICK INDICATOR WIPER

Napoléon Tremblay, 7620 Marie-Victorin Blvd., Brossard, Canada J4W 1B2

Filed Dec. 14, 1988, Ser. No. 284,295

Int. Cl.[4] G01F *15/12*

U.S. Cl. 15—210 B **7 Claims**



1. A wiper member for use in removing a liquid film deposited on a dip stick, comprising: a small, rigid, relatively thick frame adapted to be anchored by a support surface, a cavity being made thicknesswisely of said frame along a vertical axis to define a vertical channel, said cavity being bounded by two side walls and by an inner wall of the wiper member frame wherein said dip stick can be moved through said channel in a direction generally parallel to said inner wall, at least one pair of semi-flexible flaps, edgewisely mounted at their inner ends to said opposite side walls respectively, said flaps being freely maintained in a position orthogonal to said side walls and to said inner wall, pivot means about said inner ends of the flaps to enable said flaps to pivot about horizontal axes thereabout when a transverse biasing force is applied thereto, there being no free horizontal interface between said flaps in their freely maintained position; the free end sections of said flaps being adapted to wipe the surface of said dip stick during dip stick movement through said channel, in order to remove a liquid film deposited thereon.

4,891,860

DEVICE FOR DISTRIBUTING THE AIR BLAST IN A CLEANING DEVICE FOR TEXTILE MACHINES

Ulrich Steinike, Augsburg, Fed. Rep. of Germany, assignor to Ernst Jacobi & Co. KG., Augsburg, Fed. Rep. of Germany

Filed Nov. 8, 1988, Ser. No. 268,490

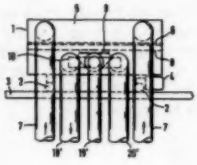
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738582

Int. Cl.[4] A47L *5/14*

U.S. Cl. 15—312 A **9 Claims**

1. A device, having a housing for distributing the air blast, in a cleaning device for textile machines having blow hoses fulfilling at least two different cleaning tasks, the blast air of a ventilator being conducted alternately into said blow hoses, said, ventilator having an impeller, a spiral ventilator housing surrounding the impeller, and at least one tuyere opening which opens into at least one air duct of the device housing; the

device housing having an air duct for each blow hose, the ventilator housing being pivoted about the impeller axis to



have its tuyere opening into each one of the air ducts alternately.

4,891,861

HAND VACUUM CLEANER

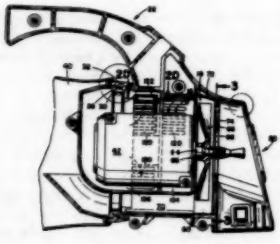
John F. Sovis, Coldwater, Mich.; Robert M. Smith, Copley, Ohio, and George H. Bramhall, Boulder, Colo., assignors to Royal Appliance Mfg. Co., Cleveland, Ohio

Continuation of Ser. No. 877,881, Jun. 24, 1986, Pat. No. 4,730,362, which is a division of Ser. No. 670,553, Nov. 9, 1984, Pat. No. 4,633,543. This application Feb. 9, 1988, Ser. No. 153,971

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] A47L *5/24*

U.S. Cl. 15—344 **2 Claims**



1. A hand-held vacuum cleaner including a housing comprising mating first and second half housing elements, said housing having a handle and a nozzle, a motor having means for drawing cooling air through the motor, a selectively-separable bag assembly, a working air channel for communicating working air from said nozzle to said bag assembly, and a motor mount portion receiving said motor and spaced from said working air channel by a motor mount portion peripheral wall;

said motor mount portion including a peripheral motor cooling air intake chamber, a peripheral motor cooling air exhaust chamber and a peripheral baffle wall extending from a housing outer wall to contiguous engagement to said motor, said housing outer wall including a plurality of air inlet vents at said cooling air intake chamber for cooling air inflow to said motor from said intake chamber, and air outlet vents at said cooling air exhaust chamber, for cooling air exhaust from said motor through said exhaust chamber, said inlet and outlet vents being oppositely spaced about said baffle wall, said means for drawing cooling air through the motor causing the cooling air to enter said inlet vents and chamber and exit the outlet chamber and vents;

said sealing peripheral wall adjacent said working air channel sealing said intake and exhaust chambers from said channel to preclude cooling air in said cooling air intake and exhaust chambers from mixing with working air in said working air channel.

4,891,862

HINGE

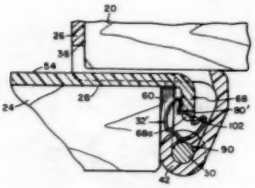
Leif A. Holan, P.O. Box 3527, Clear Lake Highlands, Calif. 95422

Continuation-in-part of Ser. No. 138,142, Dec. 28, 1987, Pat. No. 4,819,299. This application Jan. 30, 1989, Ser. No. 302,914

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] F05F *1/12*

U.S. Cl. 16—278 **19 Claims**



1. A hinge assembly comprising:

a first leaf and a second leaf having sleeves in coaxial alignment with one another;

a hinge pin coaxially journaled within said sleeves for pivotally interconnecting said first leaf and said second leaf for angular movement relative to one another;

said first leaf having a head portion projecting substantially radially with respect to said hinge pin and with respect to said sleeve of said second leaf;

said sleeve of said second leaf being formed with a pocket that is aligned and in registration with said head portion of said first leaf when said first leaf is in a closed position relative to said second leaf, said pocket having an edge;

a follower means mounted between and in contact with both said head portion of said first leaf and said sleeve of said second leaf in a manner to be co-moveable with said first leaf relative to said second leaf; and

a spring means operatively connected to said leaves for biasing said head portion in a direction substantially radially disposed to said hinge pin along an axis that is distally offset relative to the axis of said hinge pin;

contacting parts of said head portion, said follower and said sleeve of said second leaf having shape characteristics such that when said leaves are in a relatively open condition said follower is restrained by said sleeve of said second leaf against rocking movement relative to said head portion and such that when said head portion and said follower are rotated past said edge of said pocket said follower undergoes rocking movement relative to said head portion and relative to said edge of said pocket.

4,891,863

DEVICE FOR OPENING FIBER BALES

Bernd Bahlmann, Steingriff, and Johann Walk, Eichstaett, both of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,225

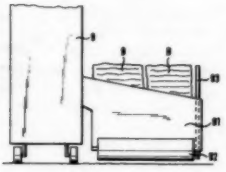
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734556

Int. Cl.[4] D01G *7/00*

U.S. Cl. 19—80 R **5 Claims**

1. In an opening machine for removing fiber from one or more stationary rows of bales supported on the floor, having an opening device which is supported on traveling rails for travel alongside said rows of bales, bale guide means comprising:

(a) A guide wall, spaced a predetermined distance from said travelling rails; and



(b) movable supporting means for supporting said guide wall, adapted to shift said guide wall transversely of said rows of bales for aligning each of said rows at a predetermined distance from said traveling rail.

4,891,864

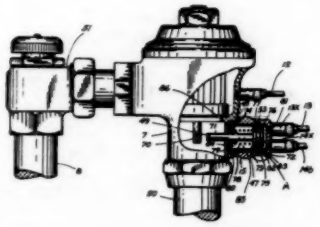
DISABLER AND ACTIVATION SYSTEM FOR PLUMBING FIXTURE

Martin J. Laverty, Jr., Earlysville, Va., assignor to Coyne & Delany Co., Charlottesville, Va.

Division of Ser. No. 18,495, Feb. 25, 1987, Pat. No. 4,802,246, which is a continuation of Ser. No. 781,944, Sep. 30, 1985, Pat. No. 4,709,427. This application Nov. 8, 1988, Ser. No. 268,483

Int. Cl.[4] F16K *31/122, 31/143;* **E03D** *3/04*

U.S. Cl. 91—399 **20 Claims**



1. In a hydraulic flush valve operating arrangement for use with a fixture having an actuating assembly including:

a housing having two fluid inlets;

a sleeve assembly in said housing;

a piston having a solid face slidable within said sleeve; and

fluid by-pass means in said sleeve assembly for diverting hydraulic fluid from one side of said piston to the other;

said piston being slidable within said sleeve assembly in response to fluid supply line pressure being supplied to said solid face with substantially equal fluid pressure in each said tubes for actuating said flush valve; and

said by-pass means cooperating with said piston and an outlet of said flush valve to a fixture to permit drainage of fluid from said housing into the fixture through said outlet of said flush valve, thereby providing uniform pressure over the face of said piston.

4,891,865

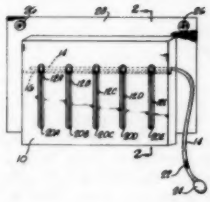
APPARATUS FOR SECURING AN ARTICLE IN A POCKET

Elmer E. Biloff, 18289 Thomas La., Shafter, Calif. 93263

Continuation-in-part of Ser. No. 150,513, Feb. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 2,506, Jan. 12, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 341,496

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—3 H **10 Claims**



1. An anti-pickpocket device to be worn in a pocket comprising:

a base member;

prong support means carried by said base member;

a plurality of prongs pivotally mounted on said support means;

biasing means carried by said base member for urging said prongs to a first position;

inflatable means carried by said base member for pivoting said prongs about said support means from said first position to a second position; and

means for inflating said inflatable means, said means for inflating being disposed exteriorly of said base member and being capable of being operated at a location remote from said base member.

4,891,866

BUCKLE OF SYNTHETIC RESIN

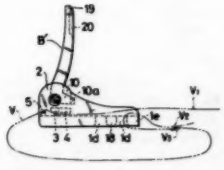
Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,436

Claims priority, application Japan, Aug. 11, 1987, 62-122883[U]

Int. Cl.[4] A44B *11/12*

U.S. Cl. 24—170 **5 Claims**



1. A buckle of polymeric organic synthetic resin comprising:

a base plate including a substantially flat base having an engaging tooth at one end thereof and a pair of spaced support members disposed on said base at respective sides thereof, said support members having respective bearing holes defined therein, and respective ridges disposed on respective inner confronting surfaces thereof at a level between said substantially flat base and said bearing holes; and

a one piece locking hook including a substantially flat base

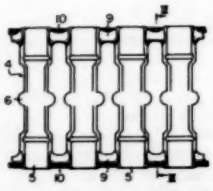
having an integral leg projecting substantially perpendicularly therefrom at one end thereof and extending fully across said one end, said leg having opposite sides engageable with said ridges, respectively, when said locking hook is turned down against said base plate, said leg having a succession of teeth on a distal edge thereof each of said teeth extending transversely across said distal edge, and a pair of support shafts projecting from opposite sides of said base of said locking hook and loosely received respectively in said bearing holes, said base plate and said locking hook being a single integral molded assembly with said support shaft fitted respectively in said bearing holes, the distance between inner confronting surfaces of said ridges being substantially the same as the length of said leg across said one end.

4,891,867

SLIDE FASTENER

Kiyoshi Takeshima, and Ryukichi Murai, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 22, 1982, Ser. No. 435,927
Claims priority, application Japan, Oct. 28, 1981, 56-172608
Int. Cl.[4] A44B *19/30*
U.S. Cl. 24—408 **8 Claims**



1. A slide fastener comprising a fastener tape and a continuous synthetic resin fastener element row produced by extruding means having a series of cavities and secured to one side edge of said fastener tape by means of element securing threads, said fastener element row including an engaging head and upper and lower legs extending from said engaging head, said individual fastener elements being connected in series at regular spaces by upper and lower synthetic resin spacer means integrally formed with the fastener elements adjacent to the free ends of the legs, said spacer means having a minimum cross sectional area in the central portion thereof and gradually increasing in diameter from said central portion towards and being connected to the opposing walls of adjacent fastener elements, further comprising connecting threads passing through said upper and lower legs of the plurality of connected fastener elements adjacent and parallel to said spacer means and anchored to said legs closer to said free ends of said legs than said spacer means.

4,891,868

EYE FOR A HOOK-AND-EYE FASTENER

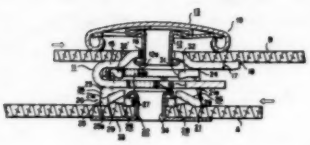
Hirokazu Watanabe, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,118
Claims priority, application Japan, Apr. 13, 1988, 63-48835
Int. Cl.[4] A44B *13/00*
U.S. Cl. 24—691 **4 Claims**

1. In a female component of a hook-and-eye fastener including: a male component provided with a hook body fixedly mounted on a garment fabric; and a female component provided with an eye body which is fixedly mounted on another garment fabric by means of an eyelet, a part of said hook body of said male component being inserted into said eye body of said female component so as to be engaged with said female component in fastening operation of said fastener, the improvement wherein:

said eye body of said female component is formed into a hollow member having its opposite end portions open to form a pair of hook-insertion openings, said hollow member comprising: a base substantially planar mounting plate section having an eyelet-insertion aperture in its central portion, into which eyelet-insertion aperture is inserted an eyelet for fixing said eye body of said female component to said garment fabric; a top engaging plate section which is spaced apart from said base mounting plate section while disposed parallel to the latter; and opposite end plate sections through which opposite end portions of said base mounting plate section are connected with those of said top engaging plate section; and wherein:

said base mounting plate section of said eye body of said female component is provided with embossed rising portions formed inside said eye body at opposite sides of said



eyelet insertion aperture and are positioned adjacent to said hook-insertion openings, respectively, whereby:

a pair of garment-fabric receiving cavity portions are formed in its outer surface abutting against said garment fabric, between which garment-fabric receiving cavity portions is interposed said eyelet-insertion aperture;

a pair of upward-and-inward sloping portions are formed in its inner surface extending inside said eye body beyond said substantially planar base mounting plate section defining partially said hook-insertion openings, between which upward-and-inward sloping portions is interposed said eyelet-insertion aperture; and

a recessed portion is formed in its inner surface, said recessed portion being interposed between said upward-and-inward sloping portions while positioned above said eyelet-insertion aperture.

4,891,869

CARDBOARD COFFIN AND METHOD FOR FORMING THE SAME

Donald W. Nutting, 1295 Ithaca Dr., Boulder, Colo. 80303

Filed Jul. 18, 1988, Ser. No. 220,529
Int. Cl.[4] A63G *17/00*
U.S. Cl. 27—4 **20 Claims**

1. A cardboard coffin formed from a plurality of separate cardboard blanks comprising:

first and second cardboard blanks for forming a pair of wall portions;

each of said wall portions comprising a top wall portion, a side wall portion and a bottom wall portion;

said top and bottom wall portions of said wall portions being in overlapping and contacting relationship;

securing means for securing said top and bottom wall portions in said overlapping relationship so that said wall portions have a transverse cross-sectional configuration wherein said top and bottom wall portions are in parallel relationship and said side wall portions comprise a pair of spaced apart relatively short inclined wall portions and a pair of spaced apart relatively long inclined wall portions;

a third cardboard blank for forming a bottom portions comprising a flat cardboard sheet having a central body portion having a perimeter defined by a plurality of score lines comprising a pair of spaced apart parallel score lines, a pair of spaced apart relatively short inclined score lines and a pair of spaced apart relatively long inclined score lines;

a plurality of integral rectangularly shaped portions extend-

ing upwardly from said perimeter of said central body portion with each of said integral rectangularly shaped portions having an angular relationship with said central body portion of about 90 degrees;

said central body portion having a length greater than its width and a lengthwise extending longitudinal axis;

said plurality of integral rectangularly shaped portions of said bottom portion being in juxtaposed relationship with portions of said wall portions; and

securing means for securing said plurality of integral rectangularly shaped portions to adjacent portions of said wall portions.

4,891,870

NEEDLING APPARATUS FOR MAKING A PATTERNED FELT WEB

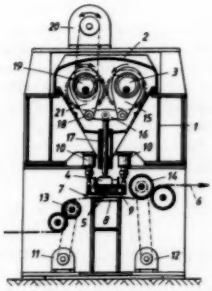
Karl Müller, Wels, Austria, assignor to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Sep. 27, 1988, Ser. No. 249,783

Claims priority, application Austria, Oct. 1, 1987, 2500/87

Int. Cl.[4] B32B *5/06*; D04H *1/46, 5/02*

U.S. Cl. 028—107 **1 Claim**



1. A needling apparatus for making a patterned felt web, comprising the combination of

(a) a felt web support,

(b) a stripper defining a multiplicity of spaced apart passages,

(1) the stripper being disposed over the felt web support and constituting a felt web guide therewith,

(c) feed drive means for continuously feeding a felt web on the felt web support through the felt web guide at a controllable feeding speed,

(d) needle board means disposed on a side of the stripper which is opposite to the felt web support, the needle board means comprising

(1) a multiplicity of needles projecting toward the felt web guide and registering with respective ones of the passages,

(e) drive means for the needle board means for reciprocating the needle board means to move the needles through the passages into and out of the felt web guide,

(f) stroke setting means for setting a stroke position of the needle board means relative to the felt web guide between an idle stroke position wherein there is no penetration of the needles into the felt web and a working stroke position wherein there is a maximum depth of penetration of the needles into the felt web continuously fed along the felt web support,

(1) the patterns of the felt web being determined by variations in the depth of penetration of the needles into the felt web, and

(g) control means for controlling the feeding speed imparted by the feed drive means to the felt web in dependence on the stroke position of the needle board means relative to the felt web guide in accordance with a programmed coordination of the stroke position of the needle board means and the feeding speed of the felt web.

4,891,871

HEDDLE TRANSFERRING APPARATUS

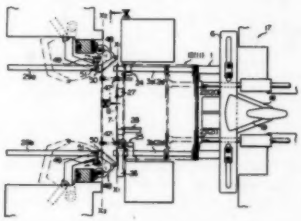
Juro Tachibana, Matsuyama, and Yoshihide Nishimura, Iyo, both of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan

Filed Jul. 8, 1988, Ser. No. 216,491

Claims priority, application Japan, Jul. 10, 1987, 62-172350

Int. Cl.[4] D03J *1/14*

U.S. Cl. 28—205 **2 Claims**



1. A heddle transferring apparatus comprising:

a heddle magazine having upper and lower magazine bars which have a plurality of heddles supported thereon;

a heddle bar supporting rack disposed in spaced and opposed relationship to said heddle magazine and having supported thereon a plurality of upper heddle bars in opposed relationship to said upper magazine bar and a plurality of lower heddle bars in opposed relationship to said lower magazine bar;

means for separating one heddle from among said plurality of heddles and maintaining said separated heddle in a first predetermined position wherein a warp thread is passed through the heddle;

a pair of upper and lower heddle transferring chucks for transferring to a second predetermined position said heddle maintained in said first predetermined position;

a pair of upper and lower heddle receiving hooks for receiving said heddle transferred to said second predetermined position from said pair of heddle transferring chucks, each of said heddle receiving hooks being movable in a direction parallel to a warp-threading direction wherein a warp

thread is passed through the heddle so as to be selectively stopped on an extension line of predetermined upper and lower heddle bars of said upper and lower heddle bars;

a pair of upper and lower heddle retaining bars for retaining said heddle of said second predetermined position in cooperation with said heddle receiving hooks, each of said heddle retaining bars being disposed parallel to said warp-threading direction and in opposed relationship to the corresponding heddle receiving hook and being movable along a vertical plane perpendicular to said warp-threading direction; and

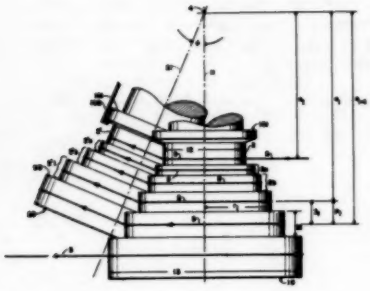
a pair of upper and lower heddle pushing bars each disposed parallel to said warp-threading direction and in opposed relationship to the corresponding heddle receiving hook and each movable along said vertical plane perpendicular to said warp-threading direction so that the heddle received on said heddle receiving hooks is inserted on said predetermined upper and lower heddle bars.

4,891,872

APPARATUS FOR INCREMENTALLY DRAWING FIBERS

Martin V. Sussman, 1361 Massachusetts Ave., Lexington, Mass. 02173

Filed May 9, 1988, Ser. No. 191,620
Int. Cl.[4] D02J 1/22
U.S. Cl. 28—244 **16 Claims**



1. In apparatus for drawing fibers in small increments by passing said fiber with plural helical turns between a plurality of spaced-apart spindles, each of said spindles being elongated about an axis that extends transversely to the helical turns of said fiber thereon and is canted relative to said axis of the other spindle, and each of said spindles having a rotating fiber-bearing outer surface the radius of which changes along said axis thereof, said fiber-bearing surface being formed of a plurality of discrete circumferential microterraces of different radii which are substantially parallel to said axis of rotation of the corresponding one of said spindles, said fiber-bearing surface being designed and disposed for engaging each helical turn of said fiber frictionally and for supporting each said turn without imposing any substantial axially-directed restraint on said fiber, the improvement wherein:

each said microterrace on at least a first of said spindles has an axial length dimension dependent on the draw increment imposed on the portion of said fiber contacting said microterrace and dependent upon the pitch (p_i) of said helical turn of said fiber helix defined by a first equation:

$$p_i=[(DI_i+\cos\phi)r_i-a_i\sin\phi]\sin\phi$$

where:

ϕ is the angle of cant of said axes as measured in the projection along the perpendicular common to said spindles;

a_1 is the axial distance between the point of intersection of said spindle axes in said projection and the first intersection of said fiber with said axis of said first spindle;

a_i is the axial distance between the point of intersection of said spindle axes and the "i"th intersection of said wrap of said fiber with said first spindle axis in said projection; and a_i is other than a_1 and is substantially related to a_1 by a second equation:

$$a_i = a_1 + \sum_{x=1}^{i-1} p_x$$

p_i is said pitch, or distance as measured on said spindle axis between consecutive intersections of said wrap of said fiber with said first spindle axis;

r_1 is the radius of said surface of first contact on said first spindle;

DI_i is the draw ratio increment imposed on said fiber as it moves from said first spindle to said other spindle, at position a_i; and is equal to the ratio of the radius r'_i to r_i, which is the ratio of the other spindle fiber receiving radius to the first spindle fiber sending radius; and

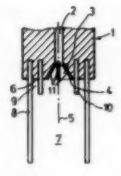
r_i is the radius of said first microterraced spindle at axial distance a_i, r_i being substantially equal to r_1 times the product of all draw increments preceding microterrace r_i.

4,891,873

DEVICE FOR CRIMPING LARGE FILAMENT GROUPS

Peter Landen, Grevenbroich; Dieter Paulini, and Wolfram Wagner, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 184,111
Claims priority, application Fed. Rep. of Germany, May 1, 1987, 3714610
Int. Cl.[4] D02G 1/16
U.S. Cl. 28—255 **6 Claims**



1. A device for crimping large filament groups comprising a channel for moving filaments in a surrounding gas stream, a face wall through which the channel opens, and a compression chamber secured to the face wall comprising a first cage and at least a second cage, each cage including a plurality of spaced apart rods extending from the face wall and concentrically arranged around the channel opening therein, the second cage having shorter rods than the first cage and being located between the first cage and the channel opening in the face wall.

4,891,874

SELF LOADING CONTROLLED DEFLECTION

Arnold J. Roerig, Beloit, Wis., and Richard R. Hergert, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 87,555, Aug. 20, 1987, Pat. No. 4,837,907. This application Dec. 6, 1988, Ser. No. 280,629
Int. Cl.[4] B21B 27/00
U.S. Cl. 29—115 **1 Claim**

1. A self-loading controlled deflection roll for use in engaging a mating roll along a nip line of contact therebetween, said roll comprising:

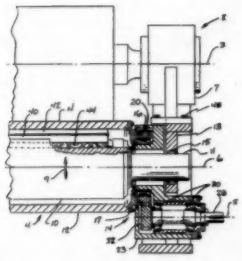
a stationary support beam;

a rotatable roll shell disposed about the beam and defining a space therebetween;

end support means supporting the ends of the support beam;

roll end assembly means secured on each end of the roll shell, including a ring gear at one end of the roll shell, said ring gear being rigidly secured relative to the end of the roll shell;

bearing housings disposed about the ends of the roll shell over the roll end assembly means independent of the end support means, the bearing housings are pivotally attached to the end support means in a plane disposed at about 90° from a plane extending between the shell roll axis of rotation and the intended nip line of contact on the roll shell with a mating roll;



pressure cylinders operatively linked with the bearing housings for urging the ends of the roll shell laterally relative to the support beam;

a non-self-aligned bearing mounted in each bearing housing intermediate the bearing housing and the roll end assembly means, and which rotatably support the roll shell and maintain rigid alignment between the roll shell and bearing housings;

roll shell support element means mounted in the beam for providing laterally-movable and rotatable support of the roll shell relative to the beam; and

means movably linking the bearing housings to the end of the support means whereby the bearing housing can move relative to the end support means.

4,891,875

METHOD FOR MANUFACTURING A PISTON FOR AN INTERNAL COMBUSTION ENGINE

Hara Soichi, and Hiroshi Kageyama, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 19, 1988, Ser. No. 245,899

Claims priority, application Japan, Sep. 17, 1987, 62-233151; Feb. 12, 1988, 63-017952

Int. Cl.[4] B23P *15/10*

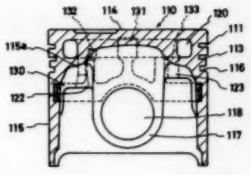
U.S. Cl. 29—156.5 R **10 Claims**

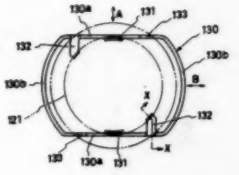
1. A method for manufacturing a piston of an internal combustion engine comprising;

holding a soluble core to a plurality of first projection portions and a plurality of second projection portions formed in a strut member, said first projections having a bent portion bent outwardly and extending along a face of said soluble core and said second projection portions having a cutting portion,

casting said strut member holding said soluble core in said piston subsequent to setting said strut member at an inside of an aggregate of an inorganic fiber positioned in a lower mold,

reinforcing a circumference of a top-ring groove of the piston by reinforcing said aggregate of inorganic fiber,





forming an oil-cooling gallery and melting away said soluble core by pouring water into said mold.

4,891,876

METHOD OF MAKING PUMP IMPELLER BY LOST-FOAM MOLDING

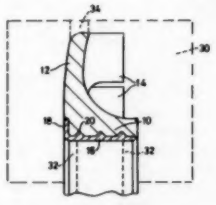
Richard R. Freeman, Ardens Grafton, England, assignor to Concentric Pumps Limited, United Kingdom

Filed Feb. 16, 1989, Ser. No. 310,907

Claims priority, application United Kingdom, Mar. 1, 1988, 8804794

Int. Cl.[4] B21K *3/04*

U.S. Cl. 29—156.8 R **5 Claims**



1. A method of making a water pump impeller having a tubular hub portion provided with a central axial aperture, a disc portion integral with said hub portion, and impeller vanes integral with said disc portion, said method comprising:

(a) forming a female die complementary to the shape of the impeller to be made;

(b) positioning a former in said die to be located in said central axial aperture of the tubular hub portion of the impeller to be made;

(c) filling said die with curable foam-like material thereby forming an impeller pattern which is mounted upon said former;

(d) curing said foam-like material of said pattern and removing said pattern from said die;

(e) using said pattern to form an impeller casting mold; and

(f) casting said impeller in said mold during which the cured foam-like material of said pattern is destroyed without destroying said former and maintaining the former in said

central axial aperture of the tubular hub portion of said impeller.

4,891,877

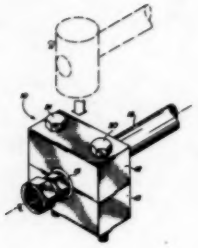
PORTABLE TOOL FOR COMPRESSING A FITTING ON A HOSE

Dino Talavera, P.O. Box 871690, Wasilla, Ak. 99687

Filed Mar. 20, 1989, Ser. No. 325,861

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—237 **3 Claims**



1. A portable tool for compressing a fitting on an associated hose comprising:

a pair of machined parts held together by a pair of bolts extending through spaced parallel openings extending through said parts,

said parts having mating surfaces machined to each form a die for receiving therein a hose fitting positioned to extend between and perpendicular to the longitudinal axis of said bolts,

at least one of said parts defining a surface on the outside of said tool parallel with and spaced from said mating surfaces,

said one of said surfaces being provided for receiving a blow from a hammer for causing said machine parts to move toward each other to cause the dies to crimp the fitting placed therein around the end of an associated hose, and

shim means one mounted in each die in said mating surfaces for rendering said tool usable for fittings and hoses of various diameters,

said shim means comprising a pair of plates one fitted to each die of each of said mating surfaces for varying the size of each die, whereby said tool may be usable with fittings and hoses of various sizes,

each of said plates comprising a pin for extending into one of the mating surfaces of said parts,

said bolts and associated openings extending through said parts in a direction substantially parallel with the direction of force applied to said one of said surfaces,

whereby said bolts may be periodically tightened to maintain alignment of said parts during application of said force.

4,891,878

METHOD OF MAKING A MAGNETIC HEAD

Yoshihiko Kawai, Kyoto; Kazuaki Koyama, and Yasuda, Isao, both of Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Division of Ser. No. 97,316, Sep. 14, 1987, Pat. No. 4,807,075. This application Jan. 31, 1989, Ser. No. 304,286

Claims priority, application Japan, Mar. 16, 1984, 59-51323; Mar. 19, 1984, 59-52722

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**

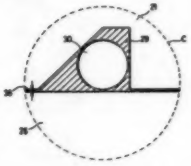
1. A method for manufacturing a magnetic head having a main core formed by bonding opposing surfaces of a pair of core halves made of alloy material to each other for forming a gap using glass material, and a pair of reinforcing core halves made of nonmagnetic material for reinforcing the main core so that the main core is sandwiched between the pair of reinforcing cores, comprising the steps of:

forming grooves on at least a surface of one of a pair of wafers made of alloy material;

forming transition metal layers both on the surface of said one wafer with said grooves and on the surface of the other wafer contacting with said surface having said grooves of said one wafer;

pressing and holding said pair of wafers so that the surfaces with said transition metal layers contact each other;

inserting glass sticks into said grooves formed on said one wafer, said one pair of wafers being pressed and held, and heating and melting said inserted glass stick to thereby permeate melted glass between contacting surfaces of said pair of wafers so that the pair of wafers are bonded to each other;



slicing and grinding the pair of bonded wafers to thereby form main cores each main core having a gap and two major opposed surfaces perpendicular to said gap;

forming transition metal layers on both said major surfaces of said main core;

pressing reinforcing cores made of non-magnetic material to both said major surfaces of said main core with said transition metal layers and holding said reinforcing cores to both said major surfaces of said main core; and thereafter

heating glass material from at least one side of said main core and said reinforcing cores to melt said glass material to thereby permeate said melting glass between said reinforcing cores and said transition metal layers so that said reinforcing cores are bonded to both said major surfaces of said main core.

4,891,879

APPARATUS FOR PICKING UP AND PLACING COMPONENTS

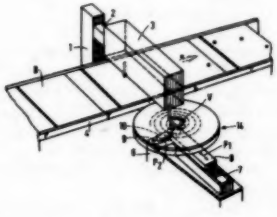
Anthonie A. De Lange, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 100,392, Sep. 24, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 266,317

Claims priority, application Netherlands, Oct. 13, 1986, 8602563

Int. Cl.[4] H05K *13/02*; B65G *1/06*

U.S. Cl. 29—822 **8 Claims**



1. An apparatus for picking up a given component from a

supply and for transferring that component to a placement position and placing it there, said apparatus being provided with a frame and with a transfer mechanism that can be moved in a reciprocating manner between a fixed pick-up point and a fixed placement point, said apparatus having at least one disc shaped carrier on one side of which the supply of components is arranged, a driving mechanism for rotatably and slidably driving said carrier with respect to the frame, said carrier being provided on the side remote from the supply of components side with uniformly extending guide track, and a guide member supported on the frame which cooperate with said guide track, said disc-shaped carrier comprising two separate elements including a supporting disc and a supply disc.

4,891,880

DRY-SHAVING APPARATUS COMPRISING AT LEAST ONE SLIDABLE SHUTTER

Ernst Poganitsch, and Arno Wolfger, Klagenfurt, both of Austria, assignors to U. S. Philips Corp., New York, N.Y.

Filed Apr. 21, 1988, Ser. No. 184,314
Claims priority, application Austria, Apr. 24, 1987, 1027/87
Int. Cl.[4] D26B *19/04*
U.S. Cl. 30—34.05 **6 Claims**

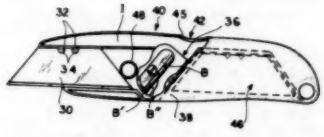
1. A dry-shaving apparatus comprising at least one slidable shutter for optionally covering or exposing a shear foil of the dry-shaving apparatus, a shaving-head frame which carries the shear foil and which is detachably secured to a basic apparatus by means of at least one resilient latch wherein the shutter is slidable from a position on the basic apparatus in which it exposes the shaving-head frame and the shear foil to a position in which it covers the shaving-head frame and the shear foil, and wherein the shutter prevents the latch from being moved for detachment of the shaving-head frame from the basic apparatus when said shutter is slid at least partly out of its position in which the shaving-head frame and shear foil are exposed.

4,891,881

COMBINED CUTTING TOOL AND SHARPENER

Norman T. Mills, 61 Harrison Ave., Glens Falls, N.Y. 12801

Continuation-in-part of Ser. No. 180,821, Apr. 12, 1988. This application May 16, 1989, Ser. No. 352,401
Int. Cl.[4] D25F *3/00*
U.S. Cl. 30—123 **5 Claims**



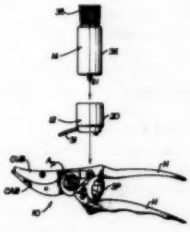
1. A combined tool comprising
an elongated handle having opposite leading and trailing end portions,
said handle comprising two shell halves having mating peripheral rims and defining a hollow interior,
releasable fastener means retaining said shell halves together with said rims in fixed abutment,
a cutting blade having a portion projecting from said handle leading end portion,
lug means within said handle adjacent said leading end portion engaging and retaining said blade in a disposition ready for cutting,
a compartment within said handle hollow interior adapted to contain spare cutting blades,
a stationary pencil sharpener assembly disposed fully within said handle hollow interior angularly offset relative the longitudinal axis of said elongated handle,
said pencil sharpener assembly including a blade fixedly mounted within said handle hollow interior,
said handle provided with an aperture adjacent said pencil sharpener assembly and defined by two complementary juxtaposed indentations in said shell half rims intermediate said handle end portions,
said aperture adapted to receive a pencil to engage said pencil sharpener fully disposed within said handle hollow interior, and a discharge slot formed in one said shell half permitting the dispensing of shavings as a pencil is sharpened by use of said sharpener within said handle interior.

4,891,882

FLUID DISPENSING SYSTEM

Walter L. Bloom, Atlanta, and Harry L. Vaughan, Lawrenceville, both of Ga., assignors to Bloomland Special Products, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 832,635, Feb. 25, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 93,353
Int. Cl.[4] A01G *3/00*
U.S. Cl. 30—123.3 **20 Claims**



1. A treatment fluid dispenser for distributing the treatment fluid onto the cutting blade of a cutting implement for plants comprising:
a container for holding the treatment fluid; said container defining a fluid chamber therein and a discharge passage therefrom;
a distributor mounted on the cutting implement, said container mounted on said distributor, said distributor defining a support surface therein adapted to seat against a portion of the cutting implement adjacent the cutting blades to rotationally fix said distributor on the cutting implement and further including a connector attachable to the cutting implement to keep said distributor in place, and said distributor defining a fluid flow passage therethrough communicating with said discharge passage from said container so that the flow of treatment fluid is applied to the cutting blades to cause the treatment fluid to be applied to the cut in the plant made by the cutting blade; and
flow control means for regulating the flow of fluid from said container out through said flow passage.

4,891,883

PLIERS

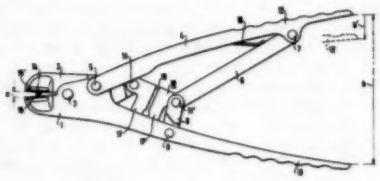
Erwin Mäntele, Tuttlingen, Fed. Rep. of Germany, assignor to Delma elektro- und medizinische Apparatebau GmbH, Tuttlingen, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 287,185

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743605

Int. Cl.[4] B26B *17/00*

U.S. Cl. 30—190 11 Claims



1. Pliers usable for surgical purposes for cutting through wires, screws and the like, comprising:

a cutter gripping lever having a first cutting edge at its front end, a handle at its rear end;

a cutting lever having a second cutting edge disposed opposite to the first cutting edge;

a cutting lever hinge pivotally connecting said second cutting edge to said cutter gripping lever;

a gripping lever pivotally connected to the cutter gripping lever behind the cutting lever hinge by a gripping lever hinge;

a transmission means between the gripping lever and the cutting lever hinge, said transmission means including a toggle lever drive and having an input drive member and an output drive member;

the input drive member including a transmission lever pivotally connected at its first end to said gripping lever;

said transmission lever and said gripping lever forming a first toggle lever;

the other end of the transmission lever loading a toggle lever hinge of a second toggle lever, said second toggle lever including a support lever pivotally connected to said cutter gripping lever and an intermediate lever, said intermediate lever extending from said toggle lever hinge to said cutting lever, said intermediate lever pivotally connected at an intermediate hinge;

wherein said input drive member of the transmission means is loaded by said gripping lever and said output drive member of the transmission means acts on said cutting lever at the side remove from the cutting edge of the cutter lever hinge which supports the cutting lever on the cutter gripper lever; and

wherein like relative pivotal movements of said gripping lever relative to said cutter gripping lever bringing about progressively smaller pivotal movements of said cutting lever relative to said cutter gripping lever as the distance between said cutting lever and said cutter gripper lever becomes smaller, so that the mechanical advantage increases automatically as the distance becomes smaller .

4,891,884

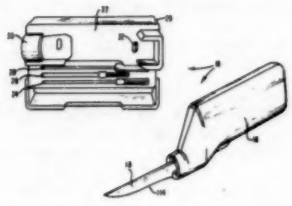
HAND HOLDABLE AUTOMATIC BLADED APPLIANCE FOR SLICING, PEELING AND THE LIKE

Philip Torbet, 26 Centre View Dr., Upper Brookville, N.Y. 11771, assignor to Philip Torbet, Upper Brookville and William R. Hebel, Sands Point, both of, N.Y.

Filed Jul. 21, 1987, Ser. No. 76,080

Int. Cl.[4] B26B *7/00*

U.S. Cl. 30—277.4 22 Claims



1. An automatic appliance for peeling, comprising:

a light weight handle assembly for conveniently holding the appliance,

a power system within said handle assembly including a power supply comprising a cylinder mounted within said handle assembly for rotation about the longitudinal axis of said cylinder and including a cam extending from and about said cylinder and which is aligned at an angle to said longitudinal axis,

a gear reduction means connecting said cylinder to a motor for rotation of said cylinder at a speed which is substantially less than the speed of said motor, a reciprocating mechanism including means for engaging said angular cam to effect rapid reciprocal movement of said mechanism as said cylinder is rotated by said motor and which is operatively connected to and reciprocated by said power supply to provide a fast acting, rapid and powerful reciprocation to said mechanism, and

a single thin blade-like peeler including a cutting guide and a blade spaced from the cutting guide, said blade defining a pair of cutting edges extending longitudinally along opposite sides of said blade adapted to be releasably connected to said mechanism for peeling.

4,891,885

METHOD OF MAKING A KNIFE HAVING A SCALLOPED CUTTING EDGE

Robert R. Fischer, Michigan City, and W. James Fischer, Valparaiso, both of Ind., assignors to Urschel Laboratories Incorporated, Valparaiso, Ind.

Filed Oct. 19, 1987, Ser. No. 109,518

Int. Cl.[4] B26B *9/02*

U.S. Cl. 30—355 7 Claims

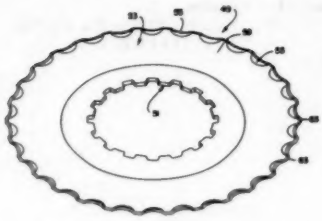
1. A method of forming a scalloped cutting edge on a knife blade comprising the steps of:

(a) providing a punch and die assembly including a first face and a corresponding second face, the second face having a plurality of scallop-shaped depressions formed therein;

(b) positioning a knife blank including an edge portion defined by a pair of opposed planar surfaces terminating at an end wall between the first and second faces; and

(c) compressing the first face towards the second face to deform the edge portion of the blank into the depressions

of the second face and outwardly of a planar surface thereof to impart a corresponding scalloped configuration



to the edge portion, wherein each scallop includes an outwardly extending convex side and a concave side.

4,891,886

INSTRUMENT FOR PRESSING ITEMS OUT OF STORAGE SPACES

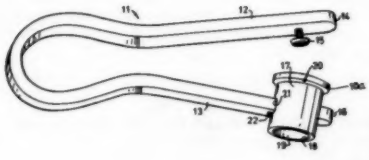
Marcus Diamant, Kungsgatan 1, S-302 45 Halmstad, Sweden; Bertil Diamant, and Peder M. Diamant, both of Ellevadsveg 6, DK-2920 Charlottenlund, Denmark

Filed Jul. 20, 1987, Ser. No. 75,613

Claims priority, application Sweden, Jul. 24, 1986, 8603201; Dec. 1, 1986, 8605130

Int. Cl.[4] B26F *1/00*

U.S. Cl. 30—363 **2 Claims**



1. An instrument for pressing an object out of a receptacle defined in a support, wherein the support includes at least one recess, the recess has an open top and the open top is closed by a covering layer of burstable material;

the instrument comprising;

a pair of arms supported to each other, which can be moved together, the first arm supporting a collet which projects from the first arm toward the second arm, and the second arm supporting a counter member facing toward the collet on the first arm, the counter member being shaped and positioned for cooperating with the collet on the first arm when the arms are moved together,

whereby when the collet is placed against the side of the support at a closed side of the recess, the counter member is placed at the covering layer over the open side of the recess such that moving the arms together presses the collet against the closed side of the recess to force the article to burst through the covering layer toward the counter member;

the counter member is substantially annular with an open region at the center positioned to receive the collet when the first and second arms are moved together; the counter member further including a receptacle adjoining the annular portion thereof for receiving an item pressed from the recess;

the second arm extending through the counter member and defining a bottom for the receptacle in the counter member.

4,891,887

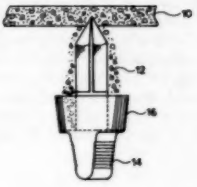
HAND HELD DRILL DRIVE

Karl Witte, 110 S. Hale, Bartlett, Ill. 60103

Filed Jun. 30, 1988, Ser. No. 213,825

Int. Cl.[4] B23F *1/16*

U.S. Cl. 30—366 **1 Claim**



1. A hand held hole scraping device for penetrating a hole through scrapable material comprising:

a shaft having a working extremity;

a cup spaced from said working extremity of said shaft and integral with said shaft for collecting debris;

a plurality of radially disposed blades formed integrally with said shaft, said blades exhibiting edges operative to cause scraping action when the shaft is rotated, and said blades defining longitudinal grooves along said shaft between said blades;

a handle formed integrally with said shaft at its end opposite said working extremity, wherein said handle presents a transversely disposed roughened planar surface for operatively grasping said handle between the thumb and finger; and wherein said shaft member, blades, cup member and handle are formed as a one piece plastic molded object.

4,891,888

AUXILIARY TOOL FOR CAREFULLY LEVELLING FINISHING FLOORS

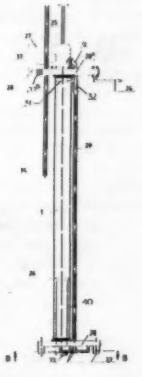
Cornelius H. Maria De Bree, NK Driebergen, and Marinus Reincke, MD Langbroek, both of Netherlands, assignors to 501 Redexim B.V., Netherlands

Filed May 11, 1988, Ser. No. 192,490

Claims priority, application Netherlands, May 12, 1987, 8701124

Int. Cl.[4] G01C *15/02*

U.S. Cl. 33—293 **7 Claims**



1. An auxiliary tool for levelling a finishing floor made of flowable mortar or similar material, comprising an outer tube adapted to be arranged vertically with respect to the floor and

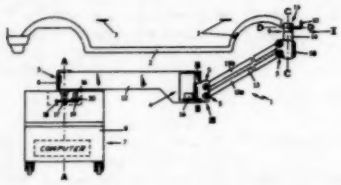
means for supporting said outer tube with its ower end spaced above said floor, a laser receiver adjustably mounted on said outer tube for receiving a laser beam located at a first predetermined height above said floor, a rod located in said outer tube and slidable axially relative thereto, a measuring pin extending laterally from said outer tube for conjoint movement therewith for alignment with a second predetermined height from said floor, means for relatively moving said outer tube and inner rod so that the lower end of said rod extends from the lower end of said outer tube in contact with said floor and said outer tube is moved to align said laser receiver with said laser beam and said measuring pin with the second predetermined height from said floor, and means for cutting the section of said rod extending below the lower end of said tube whereby said cut rod section determines the desired height of said finishing floor.

4,891,889

APPARATUS FOR MEASURE AND/OR CHECK THE POSITION AND ORIENTATION OF CHARACTERISTIC SPOTS OR AREAS IN STRUCTURES, PARTICULARLY IN MOTOR-VEHICLE BODIES

Raffaele Tomelleri, Verona, Italy, assignor to Garda Impianti S.R.L., Verona, Italy

Filed May 2, 1988, Ser. No. 189,227
Claims priority, application Italy, May 5, 1987, 84930 A/87
Int. Cl.[4] G01B *3/14, 5/24*
U.S. Cl. 33—503 **9 Claims**



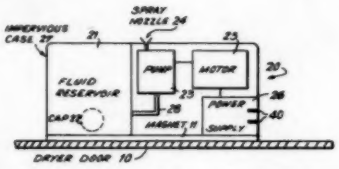
1. An apparatus for measuring or checking a spatial position and an angular orientation of characteristic spots or areas in structures, comprising an articulated arm with a number of pivot areas and having one end secured to a supporting member and a second free end from which extends a tracer element to be individually positioned adjacent each of said characteristic spots or areas in said structure to be measured or checked, a displacement transducer located adjacent at least one of said pivot areas, said transducer generating an electrical signal in dependence upon a variation in configuration of said pivot areas of the arm as compared to a reference configuration, supply means responsive to said electrical signal for supplying spatial coordinates of said spatial position and angular orientation of each of said characteristic spots or areas which are contacted by the tracer element, said articulated arm including a first element rotatably pivoted to said supporting member at a first fixed end thereof and being rotatable about a first axis, a second element having an end pivotably connected to an end of said first element that is opposite the first fixed end, said second element capable of rotating about a second axis substantially parallel to said first axis, said second element being in the form of a linkage parallelogram and comprising a pair of parallel rods capable of carrying out oscillations in a plane substantially parallel to said second axis, a supporting element adapted to retain said tracer element at an end of said second element opposite that connecting the second element to the first element, and a swinging head carrying the tracer element on said support element and being capable of performing rotations about a third axis substantially parallel to the first and second axes and about a fourth axis substantially perpendicular to the first axis.

4,891,890

METHOD AND APPARATUS FOR TREATMENT OF FABRICS IN LAUNDRY DRYERS

John A. Church, Princeton Junction, N.J., assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Nov. 9, 1987, Ser. No. 118,680
Int. Cl.[4] F26B *7/00*
U.S. Cl. 34—12 **3 Claims**



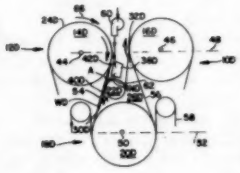
1. A universal self-contained spray apparatus powered by a battery for use in a clothes dryer comprising:
(a) a housing including attachment means for removable attachment of the spray apparatus to the dryer;
(b) a fluid reservoir within the housing, said reservoir having an opening for the introduction of a fluid fabric treating agent;
(c) a spary nozzle for injecting a spray of the agent into the dryer onto items being dried during operation of the dryer;
(d) a pump for drawing the agent from the reservoir and forcing it through the nozzle;
(e) a motor for driving the pump;
(f) a power supply housing for the battery; and
(g) timing circuit means for controlling the motor including means for setting the time when the motor is turned on and off.

4,891,891

DRYER SECTION APPARATUS AND METHOD

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 11, 1988, Ser. No. 256,347
Int. Cl.[4] F26B *3/04*
U.S. Cl. 34—23 **11 Claims**



1. A dryer section apparatus for drying a web, said apparatus comprising:
a first tier of rotatable dryers;
said first tier including:
a first dryer, the web extending around said first dryer;
a second dryer disposed downstream relative to said first dryer;
a second tier of rotatable dryers;
said second tier including:
a third dryer disposed downstream relative to said first dryer and upstream relative to said second dryer such that the web moves from said first dryer towards and around said third dryer and subsequently to and around said second dryer;
a transfer roll disposed between said first, second and third

dryers such that the distance between said transfer roll and said first dryer is less than the distance between said transfer roll and said second dryer;

a dryer felt extending contiguously with the web around said first dryer, said felt then extending around said transfer roll and thereafter around said second dryer such that a pocket is defined between the web extending between said dryers, said third dryer and said felt; and

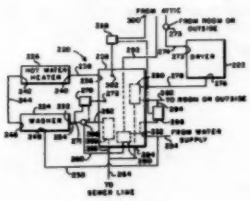
a blow box disposed between said roll and said first and second dryers, said box being disposed outside said pocket for blowing a first current of air into said pocket through said felt extending between said first dryer and said roll, said first current of air augmenting a first flow of air flowing into said pocket through said felt extending between said first dryer and said roll to balance a second flow of air flowing out of said pocket through said felt extending between said roll and said second dryer.

4,891,892

CLOTHES DRYER AND LAUNDRY SYSTEM

Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056

Division of Ser. No. 561,882, Dec. 15, 1983, Pat. No. 4,689,896.
This application Aug. 24, 1987, Ser. No. 88,883
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—86 **20 Claims**



1. A laundry system comprising a dryer having an exhaust vent for air heated in and circulated through said dryer, a water storage tank, and heat exchanger means for transferring heat from the air exiting said dryer through said exhaust vent to water contained in said storage tank, said system further comprising a washer having a drain outlet for heated waste water, and second heat exchanger means for transferring heat from the heated waste water exiting through said drain outlet to water contained in said storage tank, valve means interposed between said drain outlet and said second heat exchanger means for selectively routing the heated waste water to said heat exchanger means, said valve means being responsive to sensed temperature diferential between said waste water and the water in said storage tank.

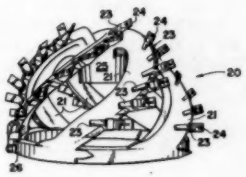
4,891,893

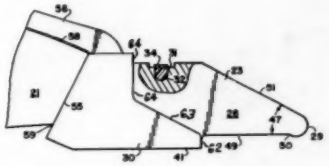
DREDGE CUTTERHEAD TOOTH ASSEMBLY

Stephen M. Bowes, Jr., Jacksonville, Fla., assignor to LVI Group, Inc., New York, N.Y.

Filed Apr. 28, 1989, Ser. No. 345,951
Int. Cl.[4] E02F *3/92*
U.S. Cl. 37—67 **43 Claims**

1. In a rotatable dredge cutterhead having helical blades and teeth attached to these blades, a replaceable tooth assembly comprising a male adapter edge designed to be welded to the leading edge of said blades of said cutterhead, a female tooth designed to interfit with said adapter, a key to lock said tooth to said adapter and key retainer means to hold said key in place; said adapter edge being an elongated member with a longitudinal axis extending from a rearward base through a wedge-shaped forward protrusion to a lateral semicylindrical nose, a pair of arms extending laterally outward from opposite sides of said base and shaped to lie along said leading edge of any one of said blades, a half keyway slot passageway extending laterally through said adapter edge and a recess with an open end positioned medially in said keyway slot and a closed end internally of said adapter edge and adapted to receive said key retainer means; said tooth being an elongated member with a longitudinal axis coinciding with said longitudinal axis of said adapter edge, a forward cutting edge positioned laterally with respect to said axis, an internal recess adapted to mate with the said protrusion of said adapter, and a lateral half keyway slot passageway extending through said tooth and aligned with said half keyway slot passageway of said adapter edge such that





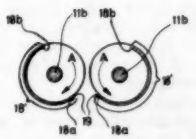
both said half slots, when aligned, produce a full slot to seat said key; said key being an elongated pin having a longitudinal axis and being of such shape in lateral cross section as to snugly fit into said full slot, and having on one elongated side parallel to said axis a recess with smoothly tapering edges connecting the bottom of said recess with said one side which engages said slot; and said key retainer means including a compressible member shaped to fit into said recess with an upper surface protruding slightly into said keyway slot and being shaped with a smoothly tapering protrusion to interfit with said recess in the surface of said key.

4,891,894

COVER SHEET ATTACHMENT FOR A TUNNEL FINISHER PNEUMATIC ROLL

Reinhardt Veit, Fuchstal-Seestall, Fed. Rep. of Germany, assignor to Veit GmbH and Co., Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 198,075
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1987, 3721422
Int. Cl.[4] D06F *61/06*; D06B *23/16, 23/02*
U.S. Cl. 38—66 **6 Claims**



1. A tunnel finisher comprising pneumatic rollers for defining an entrance or an exit, respectively, of a clothing treatment space, each pneumatic roller comprising a shaft having ends

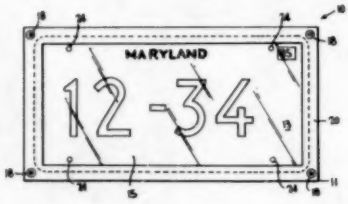
supported by a bearing secured to a housing, bottom-and-top-side discs connected to said shaft, and an envelope secured to said discs, said envelope enveloping a hollow cylindrical interior room extending between said discs, said envelope being adapted to be supplied with compressed air, said envelope being formed of a sheet in the form of a cylinder so as to form an overlap portion between exterior and interior positioned free longitudinal edges of said sheet said exterior positioned free longitudinal edge being positioned exteriorly of said envelope and said interior positioned free longitudinal edge having positioned within said interior room.

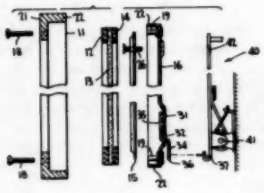
4,891,895

LICENSE PLATE HOLDER

Pascal DeLaquil, Jr., 111 Williamsburg Dr., Export, Pa. 15632

Filed May 24, 1985, Ser. No. 737,429
Int. Cl.[4] G09F 7/00
U.S. Cl. 40—209 **18 Claims**





1. A license plate holder for providing a weather-proof and tamper-proof enclosure for a standard size vehicle license plate and adapted for connection to a license plate mounting support secured to a vehicle, the mounting support having at least two screw-receiving holes spaced by a standardized distance to permit the license plate to be secured to the mounting support by means of respective mounting screws extending through respective apertures in the license plate into and secured in the holes, said license plate holder comprising:

a backing plate having a front surface, a rear surface, and at least one dimension larger than a corresponding dimension of said license plate, there being two mounting apertures defined in the backing plate and spaced by said standardized distance for alignment with said license plate apertures, said two mounting apertures being located to expose first and second end portions of said forward surface when said license plate is placed against said forward surface with said license plate apertures aligned with said mounting apertures;

means securing said license plate and said backing plate to said mounting support with the license plate disposed adjacent said forward surface and said mounting support disposed adjacent said rear surface, said securing means comprising respective mounting screws extending through said license plate apertures and said mounting apertures into said holes in said mounting support;

a frame member having four sides defining an open area therebetween, said frame member having a front surface and a back surface;

a transparent pane member having a surface area slightly larger than said open area but smaller in said at least one dimension than said frame member and said backing plate, said pane member being disposed between the back surface of said frame member and said license plate;

wherein said frame member is larger in said at least one dimension than said license plate such that first and second end segments of said frame member are spaced from and aligned with said first and second end portions, respectively, of said backing plate without any portions of said pane member and said license plate interposed therebetween; and

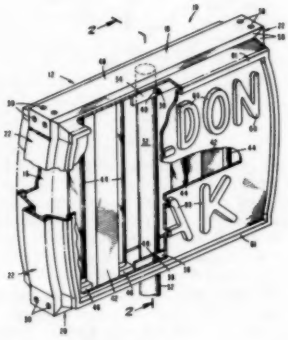
removable means for selectively securing said frame member to said backing plate, said removable means including first engagement means joining said first end segment of said frame member to said first end portion of said backing plate, and second engagement means for securing said second end segment of said frame member to said second end portion of said backing plate.

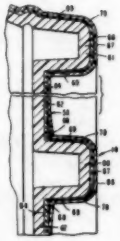
4,891,896

SIMULATED NEON SIGN

Vernie A. Boren, Lakewood, Calif., assignor to Gulf Development Corporation, Torrance, Calif.

Filed Aug. 15, 1988, Ser. No. 232,238
Int. Cl.[4] G09F 13/00
U.S. Cl. 40—541 **14 Claims**





1. A simulated neon sign comprising:

(a) a frame;

(b) non-neon internal lighting means within the frame;

(c) a front plastic panel formed of a light transmitting plastic held by the frame and having an outer face, the outer face comprising outwardly projecting indicia and a non-

projecting region, the non-projecting region being substantially opaque to light from the internal lighting means;

(d) a first pigmented translucent coating on the indicia so that light from the lighting means can pass through the indicia; and

(e) additional pigmented coating on the non-projecting region of the panel adjacent to the indicia, the additional coating being of substantially the same color as the first pigmented coating so that it appears that light from the lighting means passing through the indicia is reflected off the opaque non-projecting region to achieve the halo effect of neon lights; wherein the thickness of the first coating is greater at the center than at the sides of the indicia so that the intensity of light through the sides of the indicia is substantially the same as at the center.

4,891,897

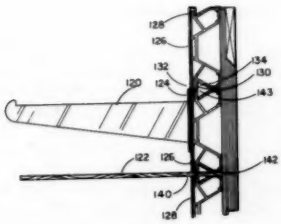
DISPLAY PANEL

Detlef J. Gieske, and David B. Kawchak, both of 13800 Ella Blvd., F207, Houston, Tex. 77014

Continuation-in-part of Ser. No. 808,421, Dec. 12, 1985, Pat. No. 4,722,147. This application Feb. 1, 1988, Ser. No. 151,228

Int. Cl.[4] G09F *7/02*; A47F *5/08*

U.S. Cl. 40—618 **15 Claims**



1. A display panel comprising:

a structural layer of rigid material;

a plurality of slat means fastened to said structural layer, said slat means having a first surface fastened to said structural layer, said slat means having a substantially planar second surface opposite said first surface, said slat means defining a horizontal slot between adjacent slat means, said slat means further comprising a receiving slot having a surface extending transverse to said horizontal slot and a surface angled relative to said horizontal slot;

fastening means attached to said structural layer, said fastening means for connecting said structural layer to an adjacent surface;

and

a strip of hook-and-loop material fastened to said structural layer at the area of the said horizontal slot, said hook-and-loop material for fixing the horizontal movement of an object placed into said horizontal slot.

4,891,898

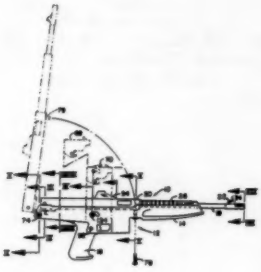
PROJECTILE FIRING WEAPON WITH A REPLACEABLE FIRING MECHANISM ACTUATOR CASSETTE

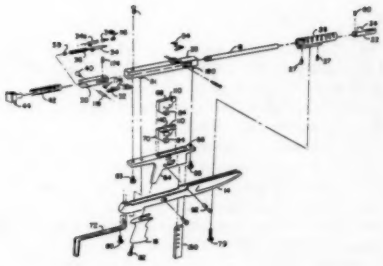
Walter R. Houseman, 5689 Country Glen, League City, Tex. 77573

Continuation of Ser. No. 229,735, Aug. 3, 1988, abandoned, which is a continuation of Ser. No. 70,248, Jul. 6, 1987, abandoned, which is a division of Ser. No. 619,926, Jun. 12, 1984, Pat. No. 4,679,487. This application Apr. 10, 1989, Ser. No. 336,591

Int. Cl.[4] F41D *11/02*

U.S. Cl. 42—69.02 **7 Claims**





1. A projectile firing weapon comprising:

a grip means defining an upwardly opening cavity having bottom, side and end walls;

a removable firing mechanism actuator cassette including at least bottom, side, end and top walls and configured to slide into said cavity;

a firing mechanism secured to said grip means so as to overlie said cavity and arranged to engage the cassette top wall and to retain said cassette bottom wall against the cavity bottom wall and the cassette top wall against the firing mechanism thereby restraining the cassette from vertical movement within the cavity;

said cassette side walls being so configured in relation to said cavity side walls that the cassette side walls are contiguous with the cavity side walls along at least a portion of their surfaces and are retained between the cavity side walls;

said cassette end walls being so configured in relation to said cavity end walls that said cassette end walls are contiguous with the cavity end walls along at least a portion of their surfaces and are retained between the cavity end walls, thereby restraining the cassette from lateral movement within the cavity;

said firing mechanism including a bolt and firing pin for detonating a projectile;

fastening means for securing said firing mechanism to said grip means; release of said fastening means causing uncovering of said cavity and release of said cassette for movement relative to said grip means and for movement relative to said firing mechanism;

said cassette including at least a trigger and sear means for actuating said firing mechanism;

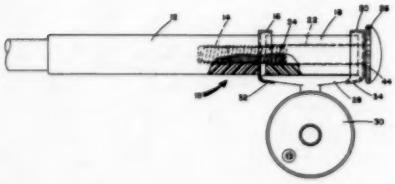
said firing mechanism and sear means arranged to engage and cooperate with each other and said trigger for controlling detonation of a projectile; and

a barrel means secured to the firing mechanism for guiding a projectile in cooperation with said firing mechanism.

4,891,899
REEL SEAT

Lee Wulff, Beaverhill Rd., Lew Beach, N.Y. 12753

Filed Jun. 17, 1988, Ser. No. 208,746
Int. Cl.[4] A01K *87/06*
U.S. Cl. 43—22 **18 Claims**



1. An apparatus to secure a fishing reel to a rod comprising:

(a) a handle associated with said rod provided at one end with an axial bore hole;

(b) a shaft dimensioned and configured at one end to engagingly fit within said bore hole;

(c) a first bracket, shaped and dimensioned to abut said handle proximate said bore, said first bracket defining a first central opening to allow said shaft to pass through said bracket into said bore hole and said first bracket defining a first catching surface to engage a first mounting foot associated with said fishing reel;

(d) a second bracket, shaped and dimensioned to define a second central opening to allow said shaft to pass through and to define a second catching surface to engage a second mounting foot associated with said fishing reel;

(e) a member associated with the end of said shaft opposite said one end of said shaft dimensioned larger than said second central opening of said second bracket; and

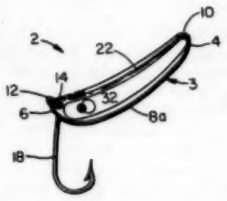
(f) a tube configured and dimensioned to be positioned wholly between said first and second brackets allowing said shaft to pass through its interior.

4,891,900
JIGGING SPOON

Gary L. Snyder, Dodge Center, Minn., assignor to UMM Holdings, Inc., Dodge Center, Minn.

Filed Dec. 27, 1988, Ser. No. 289,729
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.5 **10 Claims**

1. A fishing lure comprising a body having a fore and an aft end and peripheral edges extending therebetween and including means for securing a hook to said body and further including first and second planar body portions convergent at a substantially uniform angular displacement over the length of the lure to form a lengthwise extending apex coincident with a longitudinal axis, such that when viewed end-on said body exhibits a V-shaped concavity and when viewed side-on said apex arcuately extends back upon itself at a first radius less than a second radius exhibited by the peripheral edges, whereby upon use of said lure during a downward free floating descent,

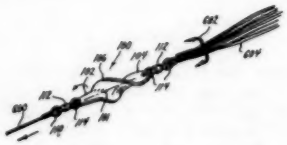


said lure orients so that said concavity will be lower than said apex as viewed end-on.

4,891,901
FISHING LURE

James E. Baker, Jr., Greenwood, Mo., assignor to Ronald Goldberg, Leawood, Kans.

Filed Mar. 13, 1987, Ser. No. 25,521
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.11 **48 Claims**



1. An artificial lure for presenting a fish-attracting action upon fishing line retrieval by the fisherman comprising:

a spinner blade having an upstream end and a downstream end;

a body section intermediate said blade ends, said body being twisted in a generally symmetrical convolution about an imaginary longitudinal axis passing through said ends;

an upstream swivel disposed adjacent said upstream end and having said axis passing therethrough;

means for connecting said upstream swivel to said upstream end;

a downstream swivel disposed adjacent said downstream end and having said axis passing therethrough;

means for connecting said downstream swivel to said downstream end;

means for connecting said downstream swivel to a fishing hook;

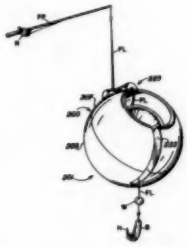
means for connecting said upstream swivel to said fishing line, said fishing lure retrieval causing water to flow over the opposed surfaces of said upstream end through said body section and over the opposed surfaces of said downstream end to rotate said spinner blade about said common axis passing through said swivels and said blade, said swivels cooperating with said ends to maintain said axis passage therethrough and said spinner blade in a generally straight-line rotatable action about said axis following the direction of retrieval of said fishing line,

said spiral progressively increases from said upstream end to the middle portion of said body and progressively decreases from said middle portion to said downstream end whereupon said water flow is collected at said middle portion of said blade and is directed by said spiral towards said downstream end.

4,891,902
FISHING BOBBER AND DEPTH FINDER

Ralph L. Whitney, Jr., 11R Summer St., Westborough, Mass. 01581

Continuation-in-part of Ser. No. 18,015, Feb. 24, 1987, abandoned. This application Nov. 5, 1987, Ser. No. 116,812
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—43.11 19 Claims



1. A combination fishing bobber and water depth finder device comprising:

a buoyant body means defining guide means for guiding passage of a fishing line during movement toward and away from an attached fishing pole; and

a line control means supported by said body means and sequentially actuatable into either first or second depth finding conditions, a fishing condition or a retrieval condition; said control means adapted in said first depth finding condition to allow movement of the line through said guide means in a direction away from the pole and in said second depth finding condition to prevent movement of the line through the guide means in a direction toward the pole; said control means further adapted in said fishing condition to engage and thereby prevent movement of the line through the guide means and to shift automatically into said retrieval condition which allows complete unrestricted movement of the line through said guide means in directions either away from or toward the pole.

4,891,903
COMBINATION SLIDING OR FIXED FISHING SINKER

Roger S. Wymore, 4612 F Ave. NE., Cedar Rapids, Iowa 52402

Filed Aug. 23, 1988, Ser. No. 235,049
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.89 4 Claims

1. A combination sliding and fixed fishing sinker comprising:

a lead body;

a circumferential slot dividing said body into first and second sides; and

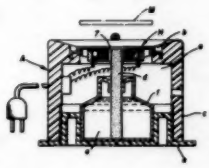
a loop member on each of opposite ends of said body located proximate said circumferential slot;

whereby the combination sliding and fixed fishing sinker is mounted on a fishing line by either: first, wrapping the line around said body, within said circumferential slot, thus achieving the fixed fishing sinker mode; or second, threading the line straight through one side of said slot and under said loop members on either end of said body, thus allowing for the sinker's slipping along the line and achieving the slip sinker mode.

4,891,904
HEATING DEVICE FOR ELECTRIC MOSQUITO KILLING APPARATUS

Yoshikatsu Tabita, Wakayama, Japan, assignor to King Chemical Kabushikigaisha, Arida, Japan

Filed Apr. 27, 1989, Ser. No. 343,632
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 3 Claims



1. A heating device for electric mosquito killing apparatus comprising:

a heat receiving plate 1 with a plane 11 for loading thereon a mosquito killing mat (M) impregnated with mosquitocide to be evaporated by electric heating, and

a heating assembly fixed on the under face of said heat receiving plate (1) and consisted of upper and lower insulating members (2, 6) and a heating element (4) arranged to be fed with electric current and sandwiched between said upper and lower insulating members(2, 6),

each of the heat receiving plate (1) and the heating assembly being provided at central portion thereof with a wick insertion hole (7) of a size allowing formation of a gap between its inner face and the sucking wick(d).

4,891,905
PLANT RECEPTACLE

Thomas O. Stolz, 845 W. Centerville Rd., Dayton, Ohio 45459

Filed Apr. 5, 1988, Ser. No. 177,925
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 5 Claims

1. In combination with a plant having roots confined within

a ball of earth, a receptacle for supporting the plant, comprising an inverted generally cup-shaped body of plastics material and having a generally uniform wall thickness, said body including a central portion defining an upwardly concaved cavity, said ball of earth disposed within said cavity, stabilizing means including a series of spaced barbs projecting upwardly from said central portion engaging said ball of earth to stabilize

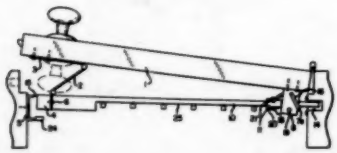
the plant, said body also including a peripheral skirt portion outwardly of said central portion and said ball of earth and projecting downwardly to engage a supporting surface, and said skirt portion having a top surface disposed above and laterally outwardly of said cavity for collecting and retaining rain or sprinkled water in said cavity for absorption by said ball of earth and said central portion being disposed to engage the supporting surface.

4,891,906

INTERLOCKING DOOR GUARD

Walter R. Knapp, 7020 SE. 87th, Portland, Oreg. 97266

Filed Jan. 6, 1989, Ser. No. 294,106
Int. Cl.[4] E05C *21/02*
U.S. Cl. 49—65 **9 Claims**



1. A door guard for use with a main door of the type having hinged connection at one of its edges on one side of the door frame and closure means on its other edge adjacent a closure edge of the door frame, said door guard comprising:

a body member having opposite side edges arranged to be disposed adjacent respective side edges of a main door,

one of said side edges including a locking edge and being disposed adjacent the closure edge of the door frame,

socket means arranged to be provided on the closure edge of the door frame,

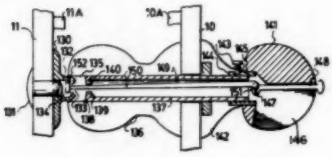
and shift lever means arranged to support said body member on the main door for lateral movement relative to the door between engagement of said locking edge in said socket means of the door frame and clearance of said locking edge from said socket means, said shift lever means being arranged to move said body member laterally when the door is opened to clear said socket means but arranged to move said body member in the opposite direction to engage said locking edge with said socket means when the door is closed.

4,891,907

SECURITY LOCK AND SEAL FOR DOUBLE DOOR OR WINDOW INSTALLATIONS

Mychail Rapaway, Box 37, Group 607, S.S. #6, Winnipeg, Manitoba, Canada R2C 2Z3

Continuation-in-part of Ser. No. 108,897, Oct. 14, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 241,492
Claims priority, application Canada, Oct. 23, 1986, 521265
Int. Cl.[4] E05B *65/04*
U.S. Cl. 49—67 **13 Claims**



1. A security assembly for double panel installations which include an inner panel and an outer panel situated in spaced and parallel relationship within a panel frame, when in the closed position and opening in opposite directions when in the open position; said assembly comprising in combination a cooperating element in the outer panel, an element in the inner panel in engaging alignment with said cooperating element of said outer panel when said panels are in the closed position, and means on an inside end of the element in said inner panel for selectively and lockably engaging said element of said inner panel with said cooperating element of said outer panel thereby securing said panels together in a unitary relationship one with the other, said cooperating element on said outer panel including retainer means on the inner side thereof, said element on said inner panel including tube means mounted on said inner panel substantially perpendicular thereto, a knob being mounted on said tube means for partial rotation of the knob, a lever assembly operatively connected to said knob and extending through said tube means, and means on an outer end of said lever assembly selectively engageable and disengageable with said retainer means, said lever assembly including a link freely extending through said tube, and an actuating means operatively engaged with the knob and an inner end of the link to transmit rotary motion of the knob to the link as the knob is rotated between a retainer means engaging and a retainer means disengaging position, the actuating means being operatively engaged with the link to shift the link end-wise in the tube in response to movement of the actuating means relative to the knob.

4,891,908

PNEUMATIC DOOR OPENER

Anthony G. Aquilina, R.R. 5, Milton, Ontario, Canada L9T 2X9

Continuation-in-part of Ser. No. 29,733, Mar. 24, 1987, and a continuation-in-part of Ser. No. 216,879, Jul. 8, 1988. This application Nov. 15, 1988, Ser. No. 271,621
Int. Cl.[4] E05F *15/00*
U.S. Cl. 49—199 **21 Claims**

1. A sliding door operator system comprising:

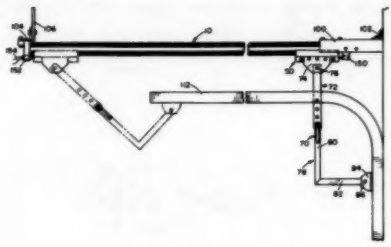
a rodless fluid cylinder comprising a cylinder body, a rodless piston adapted for reciprocation in said cylinder body, and a carriage adapted for reciprocation externally along the length of said cylinder body, said carriage being secured to said piston;

a link means for connecting said cylinder carriage to an associated sliding door;

a control means for controlling the operation of said fluid cylinder, and hence the position of the associated sliding door, wherein said control means comprises:

a source of pressurized fluid,

a directional valve communicating with said fluid cylinder for directing a pressurized fluid from said source of pressurized fluid to a respective end of said fluid cylinder,



an exhaust line communicating with said fluid cylinder for venting an exhaust fluid from said fluid cylinder, and

a back pressure relief valve in fluid communication with said exhaust line for regulating a flow of said exhaust fluid through said exhaust line.

4,891,909

CLOSURE FOR TRIANGULAR WINDOW IN A VEHICLE BODY

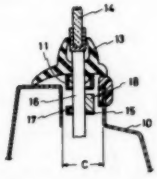
Hirotake Nakao, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 31, 1989, Ser. No. 331,170

Claims priority, application Japan, Mar. 31, 1988, 63-044508[U]

Int. Cl.[4] B60J *1/14*

U.S. Cl. 49—391 **7 Claims**



1. In a vehicle body having a triangular window formed thereon, a window closure mechanism comprising:

a shaft rotatably supported in said vehicle body;

a glass fixed to said shaft so as to be rotated therewith for opening and closing said triangular window;

a rotational stopper fixedly connected to said shaft so as to be integrally rotated therewith and provided with a cam portion which projects from said rotational stopper in the axial direction of said shaft; and

a fixed stopper fixedly connected to said vehicle body and having one end portion located on the rotational locus of said cam portion, whereby contact between said rotational and fixed stoppers determines the full opening state of said triangular window.

4,891,910

APPARATUS FOR SEALING A DOOR

Thomas G. Cook, Fairview, and Conrad J. Geibel, Jr., Erie, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Dec. 30, 1988, Ser. No. 292,280

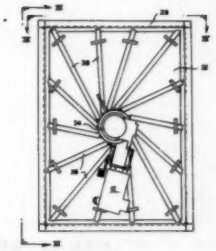
Int. Cl.[4] E05C *9/00*

U.S. Cl. 49—395 **6 Claims**

1. Apparatus for sealing the door of a chamber, the chamber being of the type wherein the door is urged into engagement with the chamber upon rotation of a locking wheel, the chamber further having a seal positioned between the door and the chamber such that upon movement of the door toward the chamber the seal is compressed, said apparatus comprising:

motor means for providing torque to the locking wheel for urging the door toward the chamber;

means for supplying current to said motor means; and



means for monitoring the current supplied to said motor means to determine if a desired degree of pressure between the chamber and the seal has been achieved based on the amount of current drawn by said motor means,

said means for supplying current being responsive to said means for monitoring so as to end the supply of current to said motor means when said desired degree of pressure between the chamber and the seal is achieved.

4,891,911

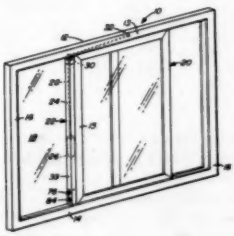
SLIDING DOOR CLOSING DEVICE

Victor J. L. Yung, 834 September Dr., Cupertino, Calif. 95014

Filed Mar. 17, 1989, Ser. No. 325,196

Int. Cl.[4] E05D *15/06*; E05F *1/00*

U.S. Cl. 49—404 **9 Claims**



1. An automatic closing device for a sliding door having upper and lower horizontal frame members interconnected by vertical frame members and supported between upper and lower track members, said closing device comprising:

an elongated tubular member;

a counterweight movable within said tubular member and forming a variable air chamber below the counterweight as it moves within the tubular member;

sealing means on said counterweight for preventing any bypassing of air as said counterweight moves within said tubular member said sealing means comprising a pair of spaced apart gasket members fixed to at least one end of said counterweight;

a flexible cable attached at one end of said counterweight and having an opposite end adapted to be anchored to said upper track member at a preselected location;

an upper end element in said tubular member including a pulley wheel for supporting said cable between its ends;

a lower end element in said tubular member forming an air tight seal therewith;

check valve means on said lower end element for allowing outside air to flow into said chamber within said tubular member while preventing air flow out of said chamber;

bleed valve means on said lower element for allowing air to flow out of said chamber at a restricted rate so as to control the downward travel of said counterweight within said tubular member when said door is closed.

4,891,912

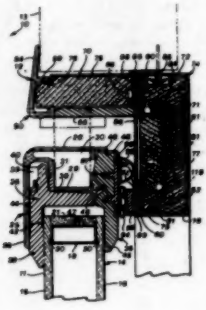
REFRIGERATOR DOOR ASSEMBLY WITH MULTIPLE GASKET SEALING ARRANGEMENT

Gerald J. Bockwinkel, Mundelein, Ill., assignor to Ardco, Inc., Chicago, Ill.

Division of Ser. No. 70,362, Jul. 7, 1987. This application Jan. 17, 1989, Ser. No. 297,340

Int. Cl.[4] E06B 7/16

U.S. Cl. 49—484 **4 Claims**



1. A refrigerator door assembly mountable in an opening in the wall of a refrigerator cabinet comprising

a door mounting frame,

at least one insulated door mounted on said frame for pivotable movement between open and closed positions relative to said mounting frame, said door including an insulated glass unit having a plurality of glass panes mounted in spaced apart relation to each other with an air insulating space therebetween,

means on said door and mounting frame for defining a pair of parallel, spaced-apart gasket seals between said door and mounting frame when said door is in a closed position, said gasket seals defining means including first and second gaskets mounted on one of said door and mounting frame and means defining respective sealing surfaces on the other of said door and mounting frame for engagement by said first and second gaskets when said door is in a closed position, and

said first gasket being a magnetic gasket and said second gasket being a compression gasket, said compression gasket being disposed in outwardly spaced relation to said magnetic gasket when said door is in a closed position for blocking communication of ambient air to said magnetic gasket when said door is in a closed position.

4,891,913

WEATHER STRIP STRUCTURE FOR USE WITH SUN ROOF

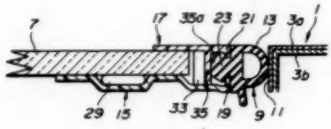
Ryoji Shimura, and Jun Takahashi, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Jul. 14, 1988, Ser. No. 218,862

Claims priority, application Japan, Jul. 17, 1987, 62-109116[U]

Int. Cl.[4] E06B 7/16

U.S. Cl. 49—493 **6 Claims**



1. In a sun roof construction including a sun roof opening bounded by a peripheral edge of a roof panel, and a lid movable relative to said roof panel and slidable into its closed position wherein said lid is received in said sun roof opening having a peripheral edge portion thereof mated with said peripheral edge of said roof panel.

a weather strip structure comprising:

a holding structure including one part which is secured to the peripheral edge portion of the lid and the other part which has first and second engaging portions which are directed toward each other, said first and second engaging portions constituting first and second supporting edges respectively; and

a weather strip including a solid base portion and an outwardly protruded lip portion, said solid portion having at its upper and lower portions first and second engaged portions, said first and second engaged portions constituting first and second slits respectively such that said first and second supporting edges are tightly received in said first and second slits respectively,

wherein said holding structure holds said weather strip having said first and second engaging portions latchingly mated with said first and second engaged portions,

said holding structure comprising:

a first supporting member bonded to a lower peripheral surface of said lid, said first supporting member having a part by which said first supporting edge is defined;

a second supporting member placed on an upper peripheral surface of said lid, said second supporting member having a part by which said second supporting edge is defined; and

means for integrally connecting said first and second supporting members.

4,891,914

COMPUTER CONTROLLED UNIVERSAL GRINDER AND METHOD FOR GRINDING TROCHOIDAL AND CIRCULAR BEARING RACES

Michel A. Pierrat, 277 Forrest La., Boulder, Colo. 80302

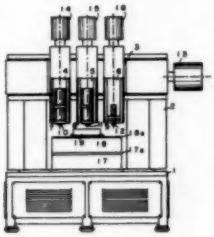
Continuation of Ser. No. 176,846, Apr. 4, 1988, abandoned. This application Jun. 19, 1989, Ser. No. 368,912

Int. Cl.[4] B25B 5/00

U.S. Cl. 51—105 R **8 Claims**

5. A machine for grinding a machine blank into a finished part having a plurality of machined surfaces, said part including a hypotrochoidal bearing race for use in a speed change device in which a rotor having an epitrochoidal outer circumference is mounted on an eccentric mounted for orbital rotation within said hypotrochoidal race and is separated therefrom by a plurality of spaced rollers in engagement both with said hypotrochoidal bearing race and said epitrochoidal surface, including

a first rotary table,
first drive means for rotating said first table,
a second rotary table,
means supporting said second table on a surface of said first table,
second drive means for rotating said second table relative to said first table,
said second drive means including means for rotating said second table in a direction opposite from the direction of rotation of said first table,



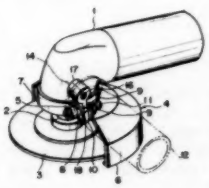
a grinding spindle,
means for adjusting the relative positions of said spindle and said first and second tables in two directions, third drive means for rotating said spindle,
a grinding wheel,
said grinding wheel having a diameter approximately equal to the diameter of one of said rollers,
means for securing said grinding wheel to said spindle, and
means for securing said blank to said second table in a position to be finished by said grinding wheel.

4,891,915

DISK GRINDER

Shigeru Yasuda, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,841
Claims priority, application Japan, Nov. 11, 1987, 62-172168[U]
Int. Cl.[4] B24B *23/02*
U.S. Cl. 51—170 T **2 Claims**



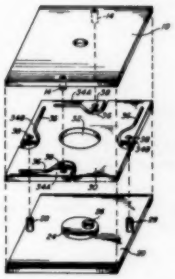
1. A disk grinder wherein a grinding wheel and a wheel guard for surrounding a part of the grinding wheel are provided for a tip end portion of a handle, said disk grinder comprising:
fixing means for fixing said wheel guard to the tip end portion of said handle,
a subhandle-fitting tool which can be fixed to the tip end portion of said handle together with said wheel guard, by said fixing means; and
a subhandle which is attachable/detachable from said subhandle-fitting tool,
said subhandle-fitting tool including a leg portion attachable to said fixing means;
said fixing means including a ring-shaped band which has at least one split section and is fitted around the tip end portion of said handle, and a pair of projections adjustably extending from the split section outwardly in a radial direction, and bolt means for fastening said pair of projections together, and
said leg portion of said subhandle-fitting tool being engaged with inner side surfaces of said pair of projections and held by them, when said subhandle-fitting tool is fixed by said fixing means.

4,891,916

OSCILLATORY OR TRANSLATIONAL TABLE FOR MACHINE TOOLS

Lawrence J. Rhoades, Pittsburg, and William D. Jenkins, North Huntingdon, both of Pa., assignors to Extrude Hone Corporation, Irwin, Pa.

Continuation-in-part of Ser. No. 107,306, Oct. 13, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 265,935
Int. Cl.[4] B24B *47/02*
U.S. Cl. 51—230 **6 Claims**



1. An orbital table assembly having a top plate which can be made to translate about an axis without rotating, comprising a fixed base member, a top plate over said fixed base member, a linkage member interposed between said base member and said top plate, a rotatable cam member rotatably secured to said top plate such that rotation of said cam member will cause said top plate to orbit in a translational path offset from the axis of translation, means for rotating said cam member, a first set of parallel deflecting arms, one end of which are connected to said linkage member and the other end connected to said base member at a point opposed on either side of the axis of translation, a second set of parallel deflecting arms perpendicular to said first pair of deflecting arms with one end thereof connected to said linkage member and the other end connected to said top plate at a point opposed on either side of the axis of translation, each pair of said deflecting arms oriented in a plane perpendicular to the axis of translation and aligned transversely to said axis, said deflecting arms thus preventing rotation of said top plate but eflecting to permit the translational motion thereof.

4,891,917

DEVICE IN A BUILDING STRUCTURE

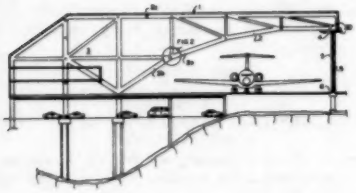
Arne M. Lerstol, Vaekeroveien 185 B, N-0751 Oslo 7, Norway

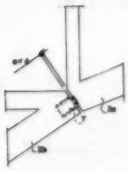
PCT No. PCT/NO88/00014, § 371 Date Oct. 17, 1988, § 102(e) Date Oct. 17, 1988, PCT Pub. No. WO88/06663, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 18, 1988, Ser. No. 264,274
Claims priority, application Norway, Feb. 24, 1987, 870763
Int. Cl.[4] E04B *1/34, 1/32*
U.S. Cl. 52—1 **19 Claims**

1. Device for use in a building structure having a supporting structure of connected supporting members subject to defor-

mation from an initial position due to its own weight and/or varying external forces comprising:

at least one force applying means operatively mounted on





said supporting structure for displacing at least one of said supporting members with respect to at least one adjacent supporting member after deformation to restore the supporting structure to the initial position.

4,891,918

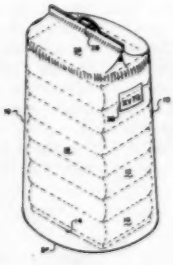
COTTON BALE STORAGE

Jack A. Wiley, Lubbock, Tex., assignor to Lov-Cot Industries, Incorporated, Lovington, N. Mex.

Filed Nov. 16, 1987, Ser. No. 121,234

Int. Cl.[4] B65D *71/00*

U.S. Cl. 52—3 **12 Claims**



1. A storage yard comprising:

a. a plurality of rows of cotton bales upon the ground,

b. each bale having four sides, a top, and a bottom,

c. each bale standing erect and spaced apart from the bales on either side thereof.

d. each bale having a stiff, tough, flexible, fireproof, water repellant cover over said bale, and

e. an indicia on the cover identifying the bale.

4,891,919

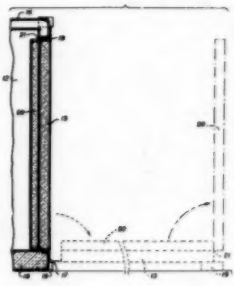
CONTAINERIZED TRANSPORTABLE HOUSE

James W. Palibroda, 221-5th Street, Prince Rupert, British Columbia, Canada V8J 3T2

Continuation-in-part of Ser. No. 940,529, Dec. 10, 1986. This application Apr. 15, 1988, Ser. No. 181,990

Int. Cl.[4] E04H *1/00, 14/00*

U.S. Cl. 52—79.5 **7 Claims**



1. A containerized house comprising, in combination:

a transportable container having the size and shape of a standard cargo shipping container, said container providing the support structure of said house and having a rectangular box-like frame;

first and second longitudinal side walls mounted by hinges along first and second bottom longitudinal side edges, respectively of said frame;

first and second end walls fixedly mounted to said frame;

top and bottom sections fixedly mounted to said frame, said top section forming part of a second floor plan of said house and said bottom section forming with said first and second longitudinal side walls, when opened, a first floor plan of said house;

first and second inner longitudinal side panels mounted by hinges along first and second top longitudinal side edges of said first and second side walls, respectively, said panels forming, when opened and erected, front and rear walls of said house; and

a plurality of composite panels stored in said container to form end wall sections, second floor sections, internal walls and roof sections of said house to create a fully enclosed living space.

4,891,920

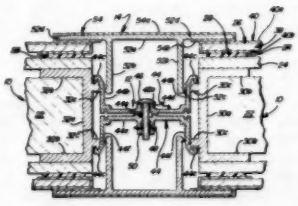
ACOUSTICAL WALL PANEL

Robert D. Pingston, Brighton, Mich., assignor to N.A.I. Acoustical Interiors, Inc., Warren, Mich.

Filed May 4, 1988, Ser. No. 190,142

Int. Cl.[4] E04B *1/84, 1/343*

U.S. Cl. 52—145 **16 Claims**



1. An acoustical wall panel assembly comprising:

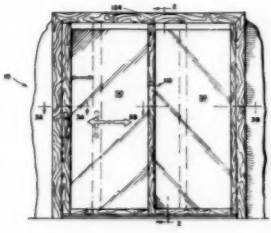
(A) a plurality of vertical acoustical wall panels with each panel including
(1) a rigid rectangular hollow frame having spaced parallel left and right vertical members and spaced parallel upper and lower horizontal members,
(2) an acoustical core panel fixedly secured within said frame, and
(3) a decorative panel having the same nominal dimensions as said frame and positioned adjacent said frame;
(B) means mounting said vertical wall panels in side-by-side relation with a vertically extending later space between the left vertical frame member of one panel and the right vertical frame member of the adjacent panel; and
(C) a plurality of cover panels sized to cover said vertically extending lateral spaces and each having means extending into a respective vertically extending lateral space to secure said cover panel in vertical relation between a respective pair of wall panels and having flange portions along the respective vertical edges thereof arranged in overlying relation to the adjacent vertical edge portions of the decorative panels of the respective pair of wall panels to maintain said decorative panels positioned against the vertical frame members of the respective pair of wall panels.

4,891,921

SLIDING DOOR ASSEMBLY WITH WEATHER SEAL STRUCTURE

Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.

Filed Mar. 30, 1987, Ser. No. 31,536
Int. Cl.[4] E04B *65/08*; E05C *9/12*
U.S. Cl. 52—207 **23 Claims**



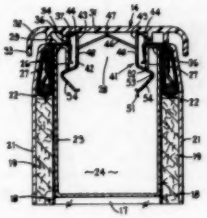
1. A sliding door assembly comprising:
a frame having two vertical jambs, a head jamb, and a sill;
at least one fixed glass door panel mounted in said frame;
at least one slidable glass door panel mounted movably in said frame, said door panel having a closure edge;
means for weather sealing the sliding glass door panel around a substantial portion of the perimeter thereof; and
locking means for said sliding glass door panel for locking same at three points, in a completely closed position as well as one point in a partially open position, said locking means including a primary dual lock having spaced apart, opposed locking pins protruding through the closure edge of the door panel and movable toward and away from one another in associated locking pin receiving openings in the associated vertical jamb of the door frame to lock and unlock the door, and at least one guide pin protruding from the closure edge of the door panel adjacent at least one of the locking pins and in alignment with a guide opening in the associated vertical jamb of the door frame to align and guide the locking pin into proper operative relationship with the locking pin receiving openings.

4,891,922

TOP CAP FOR PANEL

James S. Hozer, Muskegon, and Robert L. Gonder, Holland, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Dec. 23, 1988, Ser. No. 290,241
Int. Cl.[4] A47G *5/00*; E04F *19/06*
U.S. Cl. 52—239 **8 Claims**



1. In an upright space-dividing wall assembly including an upright panel having an upwardly-opening top channel extending longitudinally along an upper edge thereof, a horizontally elongated top cap releasably mounted on the upper edge of said panel for closing off said top channel, and a resilient retainer coacting between said top cap and said panel for releasably securing said top cap to said panel, the improvement comprising:
said top channel having top flanges which extend longitudinally therealong and which project inwardly toward one another from opposite sides thereof;
said top cap having a pair of sidewardly-spaced support ribs projecting downwardly therefrom and extending longitudinally therealong, each said support rib defining therein a retaining channel which opens sidewardly toward the other support rib; and
said retainer including (1) a sidewardly-spaced pair of upwardly cantilevered spring legs which at their upper free ends terminate in sidewardly-directed retaining flanges which engage within the respective retaining channels, (2) an upwardly-arched spring part joined between said upwardly cantilevered spring legs adjacent the lower ends thereof, said arched spring part having a middle part which is spaced upwardly from the lower ends of said upwardly cantilevered spring legs and which is normally positioned close to but spaced downwardly a small distance from an undersurface of said top cap, and (3) a sidewardly-spaced pair of downwardly cantilevered spring legs which project downwardly from said spring part and terminate in sidewardly outwardly projecting camming flanges which resiliently project under the top flanges of said top channel.

4,891,923

BUILDING STRUCTURE

Karl-Gustav Ericsson, Ribbmogatan 40, S-865 00 Alno, and Bertil Ericsson, Västergatan 13, S-852 49 Sundsvall, both of Sweden

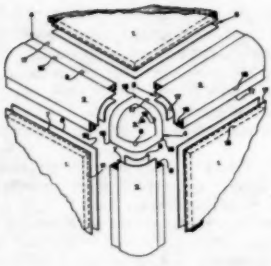
PCT No. PCT/SE86/00457, § 371 Date Jun. 7, 1988, § 102(e) Date Jun. 7, 1988, PCT Pub. No. WO88/02801, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 8, 1986, Ser. No. 205,329
Claims priority, application Sweden, Apr. 10, 1985, 8501745; Jul. 17, 1985, 8503500
Int. Cl.[4] E04B *1/343, 5/48*; E04C *2/46*
U.S. Cl. 52—280 **5 Claims**

1. A building structure comprising:
interconnectable structural building elements (1, 2, 3) formed by two rigid surface layers (6, 7) and a continuous insulating layer (8) located therebetween,
said continuous layer (8) in one of said structural building

elements (1, 2, 3) being directly adjacent to the continuous insulating layer (8) in an adjacent structural building element (1, 2, 3), so that a substantially continuous insulating layer (8) is formed in the building structure,

said structural elements (1, 2, 3) comprising for the interconnection, female and male edge portions (4, 5) for engagement with the adjacent structural building elements (1, 2, 3), said male edge portions (4) being formed by the continuous insulating layer (8) and the two rigid surface layers (6, 7), whereas the female edge portions (5) are formed by the two rigid surface layers (6, 7),

the two rigid surface layers (6, 7) including a step (9) arranged on their external surfaces (10, 11) extending away from the insulating layer (8) adjacent the male edge portions (4), said steps (9) being so arranged and adapted that the rigid surface layers (6, 7) of the female edge portions (5) lie closely adjacent to the rigid surface layers (6, 7) of the male edge portions and to the step (9) and form a substantially flat surface, at least on external surfces of the building structure facing away from the insulating layer,



in the transitions between the adjacent structural building elements (1, 2, 3),

the structural building elements (1, 2, 3) being of three different shape types, namely a first type of flat structural building elements (1), a second type of structural building elements (2) forming a portion of an envelope surface of a tube, and a third type of structural building elements (3) forming a portion of a hollow sphere, and

said third building element (3) comprising three corner regions (15), between which it engages with the second building elements (2) by means of said male and female edge portions (4, 5), said third building element (3) also engaging in the corner regions (15) thereof with the first building elements (1) by means of said male and female edge portions (4, 5);

the third building element (3) having male edge portions (4) extending entirely around its circumference and these male edge portions being received between female edge portions of the first building elements (1) in the corner regions (15) of the third building element (3).

4,891,924

CLADDING ASSEMBLY

Derrick B. Rose, Waterloo Cottage, Pen-y-Pound, Abergavenny, Gwent, NP7 7RN, United Kingdom

Filed Sep. 14, 1988, Ser. No. 244,418

Int. Cl.[4] E04D *3/362, 3/30*

U.S. Cl. 52—520 **6 Claims**

1. A cladding assembly comprising a plurality of cladding elements and a plurality of supports therefor; wherein each cladding element has a first hook formation at a first edge region, and a second hook formation at a second, opposite edge region, the first and second hook formations being oppositely directed; and each support is adapted to be mounted to a batten of quadrilateral section, each support having three flanges in a stepped array comprising (a) a first flange for overlying an outer surface of the batten, (b) a second flange extending inwardly from the first flange, and (c) a third flange extending from the inner end of the second flange, said first and second flanges being arranged to engage said batten and provide an attachment portion whereby the support is attachable to the batten of a structure to be clad; said support further including a tongue extending from adjacent the junction of the first and second flanges towards the third flange at an angle to the second flange, said tongue providing engagement means for engaging a mutually adjacent pair of first and second hook formations provided by an adjacent pair of cladding elements which extend away from the support in opposite senses, the engagement means acting to restrain their disengagement; the outer surfaces of said first and third flanges of the support providing support means for supporting the adjacent edge regions of the pair of cladding elements; and wherein each support extends in use for at least a substantial part of the width of a cladding element and provides support for both of the adjacent pair of cladding elements over at least a substantial part of the width of each.

4,891,925

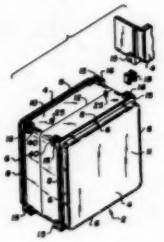
INTERCONNECTED CONSTRUCTION BLOCKS

Marion Carlson, 13544 16th Avenue, Surrey, British Columbia, Canada V4A 1P5, and Julian Carlson, 13176 - 22A Avenue, White Rock, British Columbia, Canada

Filed Oct. 11, 1988, Ser. No. 255,211

Int. Cl.[4] E04C *1/30*

U.S. Cl. 52—585 **7 Claims**



1. A construction block comprising a generally rectangular hollow body having a pair of faces joined by side edges;

spacing flanges extending about said side edges adjacent and essentially parallel to said faces to ensure correct spacing of said blocks when arranged in a wall construction;

cavities for connecting adjacent blocks together at each corner of said block having a T-shaped cross-section; and

connecting means comprising a spanning member having correspondingly shaped T-ends adapted for engagement in said cavities of adjacent blocks in order to connect said blocks into a unified wall structure;

4,891,926

WALK-THROUGH SCAFFOLDING CONSTRUCTION

Dwight Allenbaugh, 7520 Monroe St., Paramount, Calif. 90723

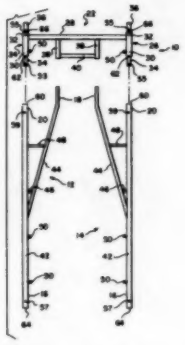
Filed Jan. 12, 1989, Ser. No. 295,983

Int. Cl.[4] E04G *1/14*

U.S. Cl. 52—637 **15 Claims**

8. An improved modular walk-through scaffold section assembly comprising a pair of upright support members laterally spaced from each other and each terminating at its lower

extremity in a single vertically disposed tubular leg and at its upper extremity in a pair of laterally spaced, upright inner and outer tubular connecting posts, and a removable crosspiece having a transverse bar member extending between all of said connecting posts, downwardly depending tubular coupling



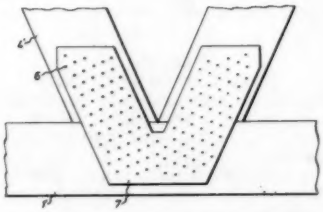
members rigidly joined to said transverse bar member and telescopically engageable with said connecting posts of said upright support members, and upwardly extending tubular coupling members adapted for telescopic engagement with a leg of another modular, walk-through scaffold section assembly located vertically thereabove.

4,891,927

JOINT FOR CONNECTING WOODEN BEAMS TO EACH OTHER, AND THE USE OF THE JOINT IN ROOF TRUSS STRUCTURES

Matti O. Kairi, Hormajärvi, and Markku S. Lehtonen, Routio, both of Finland, assignors to Metsaliiton Teollisuus OY, Espoo, Finland

Continuation of Ser. No. 85,318, Aug. 12, 1987, abandoned, which is a continuation of Ser. No. 657,145, Oct. 3, 1984, abandoned. This application Nov. 23, 1988, Ser. No. 275,678
Claims priority, application Finland, Oct. 7, 1983, 833655
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—642 **3 Claims**



1. In a truss which includes a plurality of layers of beams juxtaposed facewise against one another in a transverse direction of the truss, said plurality of layers including a first layer of wooden beams and a second layer of wooden beams juxtaposed facewise against one another so that each of said first and second layers has an inner surface with faces towards and is juxtaposed with a respective other of said second and first layers, and each of said first and second layers has an outer surface which faces away from a respective other of said second and first layers, said inner surfaces extending in respective planes which are longitudinal to said longitudinal direction of said truss, and said beams having edge surfaces which bound and extend between said outer and inner surfaces, said edges therefore extending in said transverse direction of said truss,

a joint assembly, comprising:

at least two beams in said first layer meeting at a first intersection;

at least two beams in said second layer meeting at a second intersection corresponding to said first intersection;

recess means formed in said inner surface of said at least two beams in at least one of said first and second layer so as to traverse at least one of said first and second intersections, said recess means terminating short of all of said edges except ones hidden by intersection with others of said edge surfaces in said first and second intersections, and said outer surfaces of said beams in said first and second layers being imperforate throughout where they are disposed in registry with said recess means, in the longitudinal direction of said truss, so that said recess is substantially hidden from view externally of said truss;

a substantially imperforate unitary joint having two opposite faces bounded by and edge;

a plurality of nails having inner ends secured on said plate on opposite sides thereof, so that the nails project outwards from the two opposite faces in the transverse direction of the truss, the nails having free outer ends;

said unitary joint plate being located substantially entirely within said recess means, said inner surfaces of said first and second layers of beams engaging one another facewise substantially completely about the outer periphery of said unitary joint plate, and said nails piercing into corresponding beams of said first and second layers and thereby holding said first and second layers together at said joint, said outer ends of said nails being disposed within corresponding ones of said beams and therefore terminating short of said outer surfaces of corresponding ones of said beams;

said nails being distributed with generally uniform spacing about substantially all of the opposite sides of said unitary joint plate; and

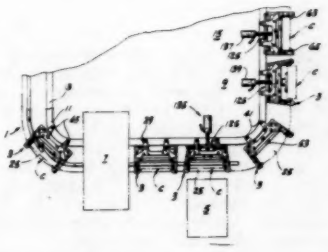
said unitary joint plate and nails providing substantially a sole mechanical means fastening said first and second layers of beams together, and respective intersecting beams in each of said first and second intersections of said first and second layers.

4,891,928

CARTON LOADING MACHINE

Robert C. James; Lloyd Kovacs, and Matthew R. Lind, all of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Sep. 14, 1988, Ser. No. 244,717
Int. Cl.[4] B65B *43/52*
U.S. Cl. 53—250 **14 Claims**



1. Carton loading apparatus comprising

an endless carton conveyor,

a series of holders carried by the conveyor each adapted to hold an erected carton in upright position,

the conveyor being movable to move each holder from a

carton receiving station for entry of an erected carton in the holder from the outside of the conveyor to a loading station for loading the carton and thence to a discharge station for discharge of the loaded carton,

each holder being open at the outside thereof for entry of an erected carton in the holder at the carton receiving station from the outside of the conveyor, and having carton-retaining means at the sides thereof movable relative to the holder between an open position for entry of an erected carton in the holder at the carton-receiving station and discharge of a loaded carton at the discharge station and a closed position for retaining the carton in the holder,

means for effecting opening of the carton-retaining means of each holder for entry of a carton in the holder at the carton receiving station and discharge of a loaded carton at the discharge station and closing of the carton-retaining means to retain a carton in the holder as it progresses from the carton receiving station to the carton loading station and thence to the discharge station,

each holder having a back and sides extending outwardly from the conveyor, one of said sides being fixed relative to the back, and

said carton-retaining means comprising a first latch member associated with said fixed side movable relative to said fixed side between a retracted open position with respect to said fixed side for entry of a carton in and discharge of a carton from the holder and a closed position with respect to said fixed side for retaining a carton in the holder, and a second latch member associated with the other side.

4,891,929

METHOD FOR THE PRODUCTION OF PRISMATIC CONTAINERS WITH PLANE GABLE SURFACES WITHOUT ANY LATERAL EARS

Franca Branchi, Parma, Italy, assignor to Italpack S.p.A., Mercogliano, Italy

Continuation of Ser. No. 44,025, Jun. 4, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 282,904

Claims priority, application Italy, Aug. 13, 1985, 4840 A/85

Int. Cl.[4] B65B *9/12*; **B65D** *75/48*

U.S. Cl. 53—451 **2 Claims**

1. A method for the production of prismatic containers having closure surfaces in the form of adjoining gable surfaces terminating in transverse sealing strips comprising the steps of:

filling completely a tube of continuous material with a liquid to provide a certain hydrostatic pressure within said tube;

continuously feeding the filled tube of continuous material;

pressing opposing lateral regions of the filled tube, which are to be connected by a transverse sealing strip, inwardly toward one another;

subsequently actuating transverse flattening members which press the gable surfaces together; and

sealing the gable surfaces together to form said transverse sealing strip and complete production of one of said prismatic containers, while simultaneously maintaining said certain hydrostatic pressure in said tube, so as to prevent an air cushion from forming inside said filled tube as said transverse flattening members are actuated, said one prismatic container being free of any lateral projections therefrom in the region of said sealing strip.

4,891,930

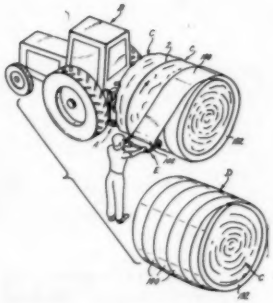
APPARATUS AND PROCESS FOR APPLYING A COVER, TO A ROUND HAY BALE

Alan W. Schaefer, Box A, Bloomsdale, Mo. 63627

Filed Apr. 4, 1988, Ser. No. 177,169

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—587 **3 Claims**



1. An apparatus for use in connection with a transport vehicle for applying a cover to a round bale of hay, said apparatus comprising: a frame configured to be attached to the transport vehicle; a spear shaft carried by and projecting from the frame far enough to project axially a substantial distance into the bale; turning means carried by the frame for imparting rotation to the bale when the bale is on the spear shaft; a track supported on the frame generally parallel to the spear shaft; a carriage movable along the track; a dispenser attached to the carriage such that it can translate to and fro relative to the carriage in a direction parallel to the track, the length of the dispenser being substantially less than the axial dimension of the bale on the spear shaft, the length of the track and the translation of the dispenser relative the carriage that is on the track being of a magnitude great enough to enable the dispenser to project beyond each end of the bale on the spear shaft; and a roll of flexible strip material held by the dispenser such that the roll can rotate to enable the strip material to pay off of it and wrap around the bale as the turning means rotates the bale, the flexible strip material having a width substantially less than the axial dimension of the bale.

4,891,931

WEED CUTTER WHEEL KIT

Paul W. Holland, Rte. 4, 18 Centark Clr., Alexander, Ark. 72002

Filed Oct. 7, 1988, Ser. No. 254,859

Int. Cl.[4] A01D *34/67*

U.S. Cl. 56—16.7 **3 Claims**

1. An apparatus for attachment to a line trimmer having a shaft portion and a head portion comprising:

wheel means including an axle;

a first U-shaped bracket having a base and legs with apertures, said first bracket inverted for insertion of said axle to elevate said bracket above a surface;

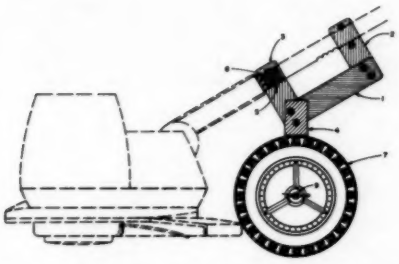
a second U-shaped bracket having a base and legs attached to said first U-shaped bracket with the bases of each bracket in abutting relation;

a first support member having ends, attached at one end to one leg of said second U-shaped bracket and at the other end of said line trimmer shaft portion by fastening means, said first support member angularly positioned on said second U-shaped bracket leg to orient said line trimmer head portion predetermined direction;

a second support member having ends, attached at one end

of said line trimmer shaft portion by fastening means and at the other end to one end of strut means in perpendicular relation;

said strut means being angularly attached at an other end to



the other leg of said second U-shaped bracket and said strut means, parallel to said line trimmer shaft portion;

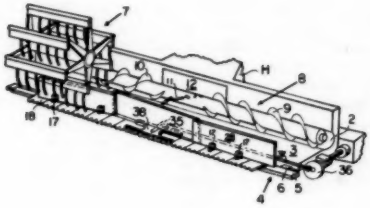
said wheel means, brackets, support members, and strut means elevating said line trimmer head portion to a height sufficient to carry out trimming.

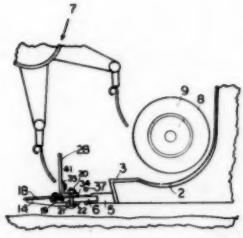
4,891,932

GRAIN-SAVER DAM FOR COMBINE CUTTER BAR

William A. Johnson, 12406 Taylorsville Rd., Jeffersontown, Ky. 40299

Filed Jun. 19, 1989, Ser. No. 368,259
Int. Cl.[4] A01D *55/02, 55/26*
U.S. Cl. 56—158 **7 Claims**





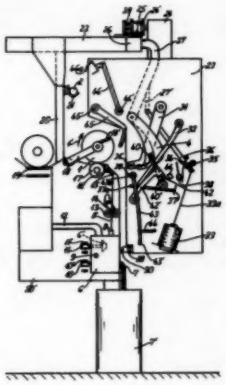
1. For use with a combine harvesting machine, having a cutter bar, including a reciprocating sickle bar, a dam, having an upstanding body portion, extending vertically to a height in the range of 2 to 4 inches and mounted on said cutter bar, behind said reciprocating sickle bar and extending across the long axis of said cutter bar.

4,891,933

METHOD AND APPARATUS FOR THE RAPID REESTABLISHMENT OF OPERATION OF A TEXTILE SPINNING MACHINE

Hans Raasch, Monchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,955
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801965
Int. Cl.[4] D01H *9/10, 9/18, 15/02;* **B65H** *54/02*
U.S. Cl. 57—269 **6 Claims**



1. A method for reestablishing the spinning operation of an open-end spinning machine following completion of spinning of a full package, wherein the spinning machine has a plurality of spinning stations at which yarn is spun using spinning elements and has a traveling service unit that includes devices for automatically forming a yarn reserve on a projecting end of the package, removing the package, placing an empty tube in position for winding yarn thereon and restarting spinning of yarn from the spinning element onto the empty tube, said method comprising:

forming a yarn reserve on a projecting end of a full package;

removing the full package with the yarn reserve thereon;

placing an empty tube in position for winding; and

during said reserve forming, package removing and tube placing

preparing and end of auxiliary yarn for restart feeding to the spinning element;

feeding the end of auxiliary yarn to the spinning element to restart spinning and withdrawing restarted yarn from the spinning element; and

engaging the restarted yarn on the empty tube to reestablish the spinning operation.

4,891,934

OIL SYSTEM FOR GAS TURBINE ENGINE

David S. Huelster, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1988, Ser. No. 264,575
Int. Cl.[4] F02C *7/06*
U.S. Cl. 60—39.08 **4 Claims**

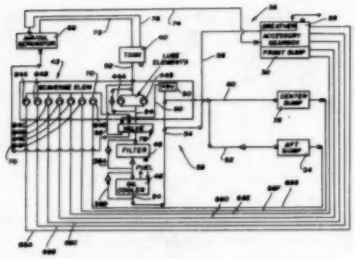
1. A gas turbine engine oil system comprising:

a supply circuit including a reservoir and an engine driven main pump having an inlet connected to said reservoir and a discharge connected to a nozzle in a sump of said gas turbine engine,

said supply circuit having a volume of residence oil between said main pump discharge and said nozzle when said main pump is operating,

a scavenge circuit including an engine driven scavenge pump having an inlet connected to said sump and a discharge connected to said reservoir, and

a distributor valve disposed in said supply circuit and in said scavenge circuit operative in response to oil pressure between said main pump discharge and said nozzle below



a predetermined threshold magnitude to disconnect said main pump discharge from said supply circuit and to connect said scavenge pump discharge to said supply circuit whereby said residence volume of oil in said supply circuit is recirculated from said sump to said nozzle by said scavenge pump.

4,891,935

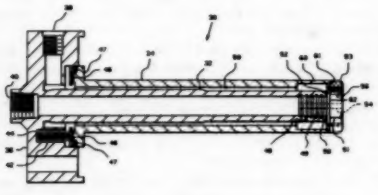
FUEL NOZZLE ASSEMBLY FOR A GAS TURBINE ENGINE

Leroy D. McLaurin, Winter Springs, Fla., and David Y. K. Toy, East Brunswick, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 111,890, Oct. 23, 1987, abandoned. This application May 26, 1989, Ser. No. 357,698

Int. Cl.[4] F02C 7/22

U.S. Cl. 60—39.37 **16 Claims**



1. A fuel nozzle assembly for a gas turbine engine comprising:

a fuel delivery tub having a delivery end and fuel inlet means at an opposite end;

a support flange attached to said fuel delivery tube generally adjacent said fuel inlet means;

an air delivery tube having an end, said air delivery tube substantially enclosing said fuel delivery tube, said air delivery tube extending axially from said support flange in spaced relation to said fuel delivery tube to define an annular air chamber between said tubes for delivery of air to said end of said air delivery tube;

engaging means comprising an integral fuel nozzle/end cap having a fuel nozzle portion and an end cap portion, said fuel nozzle portion attached to said delivery end of said fuel delivery tube and said end cap portion engaging the end of said air delivery tube, said end cap portion extending axially past said air delivery tube end and having a lip which engages said end, said lip and said end forming a seal positioned axially between said air delivery tube and said end cap portion.

4,891,936

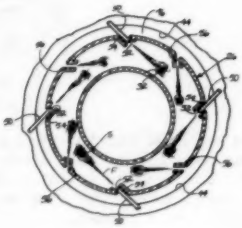
TURBINE COMBUSTOR WITH TANGENTIAL FUEL INJECTION AND BENDER JETS

Jack R. Shekleton, and Richard T. LeCren, both of San Diego, Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 28, 1987, Ser. No. 138,343

Int. Cl.[4] F23R 3/12, 3/54

U.S. Cl. 60—39.36 **9 Claims**



1. A gas turbine comprising:

a rotor including compressor blades and turbine blades;

an inlet adjacent one side of said compressor blades;

a diffuser adjacent the other side of said compressor blades;

a nozzle adjacent said turbine blades for directing hot gasses at said turbine blades to cause rotation of said rotor; and

an annular combustor about said rotor and having an outlet connected to said nozzle and a primary combustion annulus remote from said outlet, a plurality of fuel injectors to said primary combustion annulus and being substantially equally angular spaced therearound and configured to inject fuel into said primary combustion annulus in a nominally tangential direction and at least an equal number of combustion supporting gas jets located about said primary combustion annulus in alternating relation with said fuel injectors, said jets being configured to introduce a combustion supporting gas into said primary combustion annulus in a nominally tangential direction, combustion supporting gas from said jets uniformly distributing burning fuel about said annulus to thereby enable the use of fewer fuel injectors while avoiding the presence of hot spots.

4,891,937

HEAT RECOVERY SYSTEM

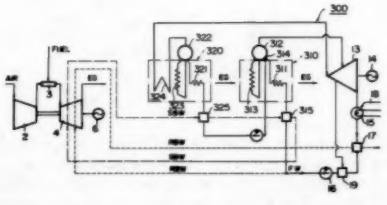
Yoshiki Noguchi, and Youichi Hattori, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,246

Claims priority, application Japan, Oct. 13, 1982, 57-178357

Int. Cl.[4] F02G 1/00

U.S. Cl. 60—39.182 **13 Claims**



12. A heat recovery system associated with a gas turbine in

which stator blades thereof are cooled by a cooling medium, said system comprising:

high pressure boiler means for generating high pressure steam by exhaust heat energy from said gas turbine;

low pressure boiler means for generating low pressure steam by exhaust heat energy from said gas turbine;

a steam turbine driven by the steam from both of said boiler means;

means for condensing exhaust steam from said steam turbine into condensation;

means for supplying both of said boiler means with said condensation as feed water;

heat exchanger means provided upstream, respectively, of said high pressure boiler means and said low pressure boiler means with respect to a direction of flow of said condensation; and

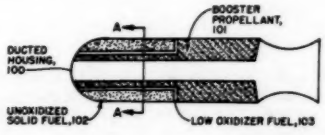
means for circulating the cooling medium from said gas turbine first through the heat exchanger means associated with said high pressure boiler means, then through the heat exchanger means associated with said low pressure boiler means, and finally through said stator blades.

4,891,938

SOLID FUEL BURN ENHANCER

Joseph G. Nagy, St. Louis County, and Daniel L. Jaspering, St. Charles, both of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 17, 1986, Ser. No. 840,619
Int. Cl.[4] F02K *9/12, 9/28*
U.S. Cl. 60—245 **3 Claims**



1. A solid fuel ramjet engine comprising:

a ducted housing having an air intake manifold at one end, and an exhaust nozzle at the other end;

a core of booster propellant housed in said ducted housing said core of booster propellant being an oxidized solid fuel core with a central passageway along the axis of the ducted housing which allows combustion to propel the ramjet engine to operational velocities;

a plurality of cores of unoxidized solid fuel which are fixed in said ducted housing and circumscribe said core of booster propellant, said plurality of cores of unoxidized fuel burning at a low burn rate to propel said ramjet engine once it has attained operational velocities; and

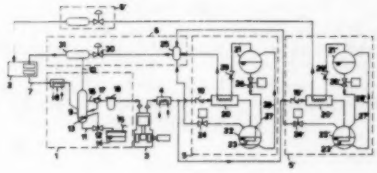
a plurality of inlays, each of which are embedded in said ducted housing between each of said cores of unoxidized solid fuel and said core of booster propellant, each of said inlays being composed of a low-oxidizer solid fuel which has a faster burn rate than that of the unoxidized solid fuel, said plurality of inlays thereby providing said ramjet engine with higher efficiency by having lower initial burn area requirements when said ramjet is operating at operational velocities, said ramjet engine subsequently burning with a lower burn rate when said inlays are consumed and said unoxidized solid fuel is being used.

4,891,939

SYSTEM FOR THE CRYOGENIC PROCESSING AND STORAGE OF COMBUSTION PRODUCTS OF HEAT ENGINES

Attilio Brighenti, Venice, Italy, assignor to Tecnomare S.p.A., Venice, Italy

Filed Nov. 28, 1988, Ser. No. 276,906
Claims priority, application Italy, Dec. 4, 1987, 22885 A/87
Int. Cl.[4] F02M *25/06*
U.S. Cl. 60—278 **4 Claims**



1. A system for processing and storing the combustion products of an engine comprising:

(a) first heat exchange means for cooling the combustion products of the engine;

(b) condensate separating means for receiving said cooled combustion products from the first heat exchange means and for separating condensed combustion products from non-condensed combustion products;

(c) mixing vessel means for receiving gaseous oxygen and a first portion of said non-condensed combustion products from said condensate separating means;

(d) dehydration means for receiving a second portion of said non-condensed combustion products from said condensate separating means and for removing liquids therefrom to thereby produce an anhydrous gas containing carbon dioxide;

(e) compressor means for compressing said anhydrous gas from said dehydration means;

(f) second heat exchange means for cooling said compressed anhydrous gas and providing a first and a second stream;

(g) cryogenic oxygen supply means for storing and maintaining oxygen in a liquid state at a substantially constant pressure;

(h) first liquefying/superheating means for receiving and cooling said first stream of said anhydrous gas to thereby condense at least a portion of said carbon dioxide from said second heat exchange means and for receiving liquid oxygen from said cryogenic oxygen supply means and heating the oxygen;

(i) first cryogenic carbon dioxide condensation/collection means for storing said anhydrous gas and condensed carbon dioxide at a substantially constant temperature and pressure;

(j) liquid oxygen circulation means through which said liquid oxygen circulates in a closed loop from said cryogenic oxygen supply means and back thereto comprising at least one liquid oxygen evaporation coil means located within said first cryogenic carbon dioxide condensation/-collection means;

(k) make-up oxygen control valve for receiving the gaseous oxygen from said first liquefying/superheating means and feeding said gaseous oxygen to said mixing vessel;

(l) cryogenic fuel supply means for storing and maintaining fuel in a liquid state at a substantially constant pressure;

(m) second liquefying/superheating means for receiving and cooling said second stream of said anhydrous gas to thereby condense at least a portion of said carbon dioxide from said second heat exchange means and for receiving liquid fuel from said cryogenic fuel supply means and heating the fuel;

(n) second cryogenic carbon dioxide condensation/collection means for storing liquid carbon dioxide obtained from

the second liquefying/superheating means at a substantially constant temperature and pressure; and

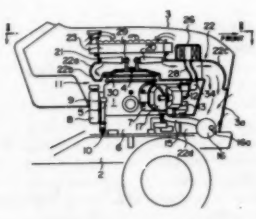
(o) liquid fuel circulation means through which said liquid fuel circulates in a closed loop from said cryogenic fuel supply means and back thereto comprising at least one liquefield fuel gas evaporator coil means located within said second cryogenic carbon dioxide condensation/collection means.

4,891,940

MUFFLER COOLING STRUCTURE FOR LIQUID-COOLED ENGINE SYSTEM

Shinichi Tamba, Kakogawa, and Hitomi Miyake, Miki, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 17, 1987, Ser. No. 122,013
Claims priority, application Japan, Nov. 20, 1986, 61-277932
Int. Cl.[4] F01N *31/02*
U.S. Cl. 60—320 **19 Claims**



1. A liquid-cooled engine system comprising:

a liquid-cooled engine arranged within an engine housing;

a radiator arranged within the engine housing, cooling liquid for said engine flowing through said radiator;

means for generating air flow passing through said radiator to cause the air flow to cool the cooling liquid flowing through said radiator;

duct means arranged within the engine housing, for guiding the air flow having passed through said radiator to the outside of the engine housing without exposure of the air flow to said engine; and

an exhaust muffler located in the vicinity of the bottom of said engine and connected to said engine, at least a part of said exhaust muffler being disposed within said duct means so that said exhaust muffler is cooled by at least a part of the air flow guided by said duct means.

4,891,941

FREE PISTON ENGINE-PUMP PROPULSION SYSTEM

Richard P. Heintz, 1841 Oakland Dr., Kalamazoo, Mich. 49008

Filed Aug. 1, 1988, Ser. No. 226,622
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—416 **2 Claims**

1. A stored energy vehicle propulsion system, comprising:

a prime mover comprising a double-acting free piston engine-pump having an output to which is supplied a pressurized hydraulic fluid;

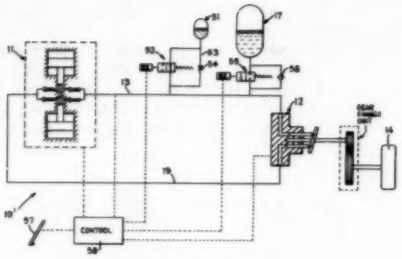
hydraulic motor means driven by said hydraulic fluid for effecting rotational driving of vehicle wheels;

passage means communicating between said engine-pump and said motor means for transmitting pressurized hydraulic fluid from said engine-pump to said motor means;

first pressure-type accumulator means connectable in fluid communication with said passage means for storing said hydraulic fluid therein at a relatively high pressure which approximately corresponds to the maximum operating pressure of said hydraulic motor means, said first accumulator means having a first capacity for said hydraulic fluid;

first valve means for controlling flow of hydraulic fluid between said first accumulator means and said passage means, said first valve means being normally maintained in a closed position preventing flow of pressurized hydraulic fluid from said first accumulator means into said passage means except when the pressure in said passage means is at a relatively high steady-state pressure and said motor means demands a sudden increase in pressure;

second accumulator means connectable to said passage means for storing a quantity of said hydraulic pressure fluid therein at a pressure level which normally approximately corresponds to the pressure level in said passage means, said second accumulator means having a capacity which is normally at least no more than one-tenth the capacity of said first accumulator means; and



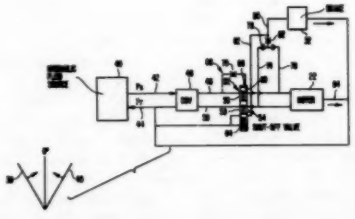
second valve means for controlling flow of hydraulic fluid between said second accumulator means and said passage means, said second valve means being normally maintained opened so as to cushion normal pressure variations of the hydraulic fluid within said passage means, said second valve means being closed in response to the pressure level demanded by the motor means exceeding the system pressure by a predetermined differential so as to isolate said second accumulator means from said passage means to permit rapid increase of pressure within said passage means.

4,891,942

HYDRAULICALLY POWERED ACTUATOR FOR MAINTAINING A MEMBER UNDER PRELOAD

Robert A. Schwarz, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 27, 1988, Ser. No. 211,974
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—436 **35 Claims**



1. A hydraulically powered drive unit for moving member into and away from a position at which the a member is under a preload comprising:

(a) a hydraulically powered motor coupled to the movable member, for moving the movable member to and from the position at which the member is preloaded;

(b) a source of pressurized hydraulic fluid coupled to the hydraulic motor for supplying power to the motor for moving the member;

(c) a brake, coupled to the movable member, for holding the movable member in the position at which the member is preloaded; and

(d) hydraulic control means, coupled to the motor, the brake, and the source of pressurized hydraulic fluid which is responsive to pressure variations originating within the drive unit, to actuate the brake after the motor has moved the member to the position at which the member is preloaded and deactivates the motor while maintaining the member under preload.

4,891,943

AXLE DRIVING APPARATUS

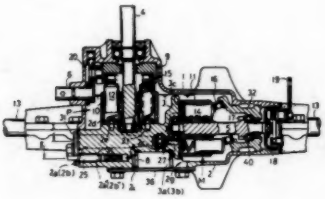
Hideaki Okada, Takarazuka, Japan, assignor to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

Filed Feb. 1, 1989, Ser. No. 304,590

Claims priority, application Japan, Feb. 3, 1988, 63-24194

Int. Cl.[4] F16D *39/00*

U.S. Cl. 60—464 **7 Claims**



1. An axle driving apparatus which journals axles between an upper half casing and a lower half casing vertically divided and disposes a hydraulic pump connected in association with an engine and a hydraulic motor driven by oil pressure from said hydraulic pump and driving said axles within a casing formed by joining said upper half casing and lower half casing, characterized in that the pump mounting surface for said hydraulic pump is formed horizontally on the inner surface at the bottom of said lower half casing, the motor mounting surface for said hydraulic motor is formed on the side surface of a rising erected adjacently and perpendicularly to said pump mounting surface, and a pump shaft of said hyraulic pump is disposed vertically to said axles and a motor shaft of said hydraulic motor is disposed in parallel to said axles.

4,891,944

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Akihito Okuda; Yoshihiro Katagiri; Eiichiro Kawahara, and Kenichi Ikejiri, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,481

Claims priority, application Japan, Dec. 12, 1986, 61-296241

Int. Cl.[4] F16D *39/00*

U.S. Cl. 60—489 **12 Claims**

1. A hydraulically operated continuously variable transmission comprising:

a transmission case;

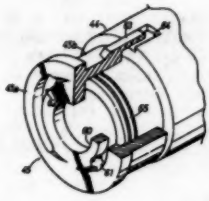
a fixed shaft mounted in said transmission case;

an output shaft rotatably supported in said transmission case;

a hydraulic motor coupled to said output shaft and having a motor cylinder and an annular array of slidable motor plungers disposed around an axis of rotation thereof and slidably disposed in respective cylinder holes defined in said motor cylinder, said hydraulic motor also having a distribution ring supported on said fixed shaft and rotatable relatively to and slidable against an end face of said motor cylinder for introducing high-pressure oil successively into said cylinder holes and discharging oil successively from said cylinder holes in response to rotation of said motor cylinder;

an input shaft rotatably supported in said transmission case;

a hydraulic pump coupled to said input shaft, at least one of said hydraulic pump and said hydraulic motor being of the variable-displacement type;



a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor; and

stop means holding said distribution ring in engagement with said fixed shaft for preventing said distribution ring from rotating with respect to said fixed shaft.

4,891,945

BOOST-FAILURE RESPONSIVE FLUID TAPPING VALVE IN TANDEM MASTER CYLINDER WITH BOOSTER PISTON AT PEDAL-REMOTE END OF MASTER CYLINDER

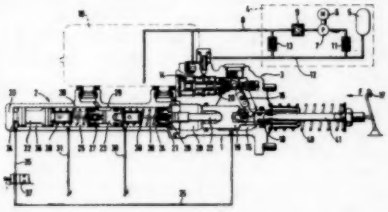
Horst-Peter Becker, Floersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Fraukfurt am Main, Fed. Rep. of Germany

Filed Aug. 5, 1987, Ser. No. 81,872

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1986, 3627147

Int. Cl.[4] B60T *13/14*

U.S. Cl. 60—547.1 **7 Claims**



1. A brake pressure generator for a hydraulic brake system of automotive vehicles, said system comprising a master brake cylinder having a master cylinder piston and a working chamber for connection to a brake circuit, pedal actuating means adapted to act on the master cylinder piston and located at one end of the master cylinder, a hydraulic brake force booster having a booster chamber and a slideably disposed booster piston disposed in the opposite end of the master cylinder relative to the pedal actuating means with one operating surface of the booster piston being adjacent and directly confining the working chamber of the master cylinder, connecting means for connecting the booster chamber at the opposite end of said master cylinder to a hydraulic auxiliary pressure source, control valve means for controlling auxiliary pressure in the booster chamber, said pedal actuating means acting directly on the master cylinder piston upon the failure of auxiliary pressure and separately from the auxiliary pressure, and means to maintain pressure in the booster chamber to prevent displacement of said booster piston upon failure of auxiliary pressure,

wherein said means to maintain pressure in the booster chamber includes a valve located between the connecting means and the booster chamber, said valve being normally open and being closeable upon failure of auxiliary pressure, said valve being controlled into its closing position upon decreasing of auxiliary pressure below the brake pressure in the master brake cylinder.

4,891,946

APPARATUS FOR CONTROL OF OPERATIONAL CHARACTERISTICS OF SUPERCHARGER IN INTERNAL COMBUSTION ENGINE

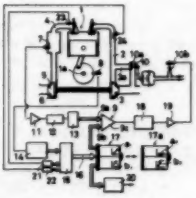
Kazuo Inoue, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 567,614, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 276,086, Jun. 22, 1981, abandoned. This application Jun. 25, 1985, Ser. No. 748,695

Claims priority, application Japan, Jun. 24, 1980, 55-84577

Int. Cl.[4] F02B 37/12

U.S. Cl. 60—602 **8 Claims**



1. An apparatus for controlling the operational characteristics of a supercharger in an internal combustion engine, the supercharger including a compressor, said apparatus comprising:

a pressure sensor positioned in an intake passage downstream of the compressor for detecting the pressure of the compressor;

a revolution sensor operatively coupled to the engine for detecting the revolution speed of the engine;

a processing means having inputs thereof coupled to the pressure sensor and revolution sensor, said processing means including,

(a) an arithmetic circuit means operatively connected to said revolution sensor for receiving the output thereof which corresponds to the speed of the engine,

(b) an address decoder means having a plurality of inputs and being operatively connected at one end of said inputs to said arithmetic circuit means for receiving the output thereof,

(c) an analog-to-digital converter, operatively connected to said pressure sensor to receive the output thereof,

(d) changeable memory means operatively connected to said address decoder for storing predetermined reference pressure values corresponding to specific revolution speeds of the engine and, in response to input from said address decoder, provide an output pressure signal corresponding to the engine revolution speed signal as a predetermined control characteristic, and

(e) a comparator receiving inputs from said analog-to-digital converter and said memory means, wherein said comparator compares the sensed pressure from the analog-to-digital converter to the output pressure signal from said memory means, and provides an output of the processing means in accordance with the comparison;

control means coupled to the output of the processing means, for controlling the pressure of the compressor in accordance with the output signal of the processing means;

structural means for accepting said memory means such that said memory means may be changed, thereby changing the predetermined control characteristic; and

wherein a boost pressure sensor is provided in said intake passage downstream of said pressure sensor, said boost pressure sensor being connected to a boost pressure compensating circuit which in turn provides an input to said address decoder means.

4,891,947

METHOD OF CONTROLLING SUPERCHARGING PRESSURE IN INTERNAL COMBUSTION ENGINES

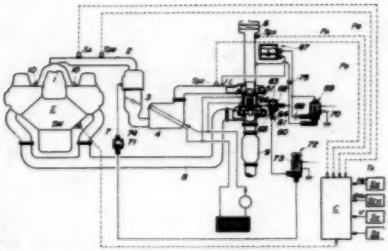
Noriyuki Kishi; Masao Kubodera, and Eitetsu Akiyama, all of Wako, Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,303

Claims priority, application Japan, Dec. 29, 1987, 62-334198; Apr. 19, 1988, 63-97598

Int. Cl.[4] F02B 37/12

U.S. Cl. 60—602 **6 Claims**



1. A method of controlling supercharging pressure in an internal combustion engine having supercharging pressure control means, wherein the supercharging pressure is controlled by controlling a control amount by which said supercharging pressure control meals is operated, said control amount being corrected by a correction value depending upon at least one operating parameter of said engine

the method comprising the steps of:

(1) controlling said control amount in feedback control mode responsive to a difference between an actual value of the supercharging pressure and a desired value thereof when the supercharging pressure is in a steady state;

(2) obtaining a learned value of said correction value by calculating values of same applied during the control in feedback control mode;

(3) controlling said control amount in open loop control mode based upon said learned value of said correction value when the supercharging pressure is in a transient state; and

(4) inhibiting the execution of said step (2) when a predetermined condition is satisfied when the supercharging pressure is in said steady state.

4,891,948

STEAM TURBINE-GENERATOR THERMAL PERFORMANCE MONITOR

Jens Kure-Jensen, Schenectady, and Harris S. Shafer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 563,258, Dec. 19, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 814,279

Int. Cl.[4] F01K 13/02

U.S. Cl. 60—645 **5 Claims**

1. In a power plant including a steam generator, a steam turbine and an electric generator, a monitoring and display system providing a different data output to one of an operator

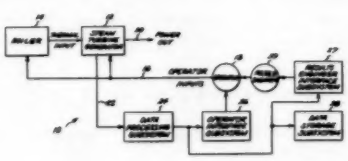
display and an engineer display, the monitoring system comprising:

(i) means for sensing power plant current operating conditions such as steam temperatures, steam pressures, inlet valve positions, and electric generator outputs;

(ii) an operator thermal performance monitor connected to the operator display comprising:

(a) a deviation from design calculator for determining differences between the current measured operating conditions of temperature and pressure and the design operating conditions of temperature and pressure, said deviation from design calculator output connected to the operator display,

(b) an economic loss calculator for determining the money loss per unit time based upon inputs related to heat rate in the steam turbine, the steam turbine exhaust, a system design heat rate and electrical output, said economic loss calculator output connected to the operator display; whereby, the operator display includes: valve position; money loss per unit time; measured generator output or load; measured pressure and temperature;



and, deviations of measured temperature and pressure from design temperatures and pressures;

(iii) an engineer thermal performance monitor connected to the engineer display comprising:

(a) a turbine efficiency calculator for determining actual turbine efficiency based upon enthalpy;

(b) a design efficiency calculator for determining an ideal turbine efficiency based upon measured operating conditions;

(c) a deviation from heat rate calculator for comparing actual turbine efficiency with the ideal turbine efficiency;

(d) means for calculating main steam temperature power loss; means for calculating main steam pressure power loss; means for calculating turbine efficiency power loss and means for calculating exhaust pressure power loss all connected into the engineer display along with inputs related to actual and design temperature and generator load; whereby, the engineer display includes: valve position, design efficiency; actual efficiency; deviation from heat rate calculation; power loss calculations, measured load and temperature/pressure readouts.

4,891,949

DEVICE FOR STORING AND DISPENSING OF CREAMERS

James F. Caldarola, 30 Garford St., Springfield, Mass. 01118

Filed Nov. 15, 1988, Ser. No. 271,321
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3.2 **15 Claims**

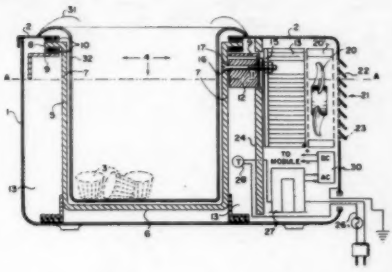
1. A cooling and storage device for the dispensing of creamers equipped with side wall means,said side wall means operatively connected thermally to the cooling side of at least one thermoelectric module,

said side wall means positioned substantially in a vertical orientation and of sufficient thickness and thermal conductivity to maintain less than about a 10 degree F differential in temperature between the coolest and the warmest portion of said side wall means,

said side wall means when viewed from the vertical being substantially of closed cross-section,

a bottom wall means connected to the bottom of said side wall means to form a vessel the inside of said vessel which defines a refrigerated space,

an open vessel end which is positioned substantially opposite said bottom,



a removable container means having an open end in which said creamers are placed,

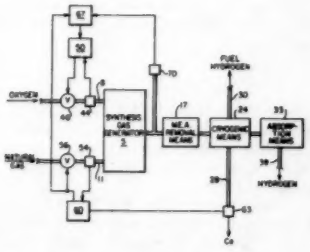
said removable container means placed substantially within said refrigerated space in said vessel.

4,891,950

CONTROL SYSTEM AND METHOD FOR A SYNTHESIS GAS PROCESS

Frederick B. Seufert, Bedford Hills, N.Y., and Pierre J. Osterrieth, Ridgefield, Conn., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 7, 1988, Ser. No. 267,948
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—37 **12 Claims**



1. A control system for controlling a synthesis gas process comprising:

generator means receiving oxygen and natural gas through separate pipes for providing synthesis gas,

methane sensing means connected to the generator means for sensing the methane content of the synthesis gas and providing a methane signal corresponding thereto,

removal means connected to the generator means for removing carbon monoxide and fuel hydrogen from the synthesis gas and providing the carbon monoxide and the fuel hydrogen to separate pipes,

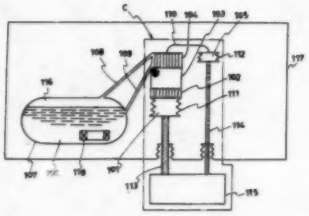
pressure sensing means connected to the pipe containing the carbon monoxide for sensing the pressure of the carbon monoxide in the pipe and providing a pressure signal corresponding thereto, and

control means connected to the pipes carrying the oxygen and natural gas, to the methane sensing means and to the pressure sensing means for controlling the oxygen and natural gas entering the generator means in accordance with the methane signal and the pressure signal.

4,891,951
REFRIGERATION SYSTEM

Kiyoshi Ishibashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan

Filed Dec. 27, 1988, Ser. No. 290,428
Claims priority, application Japan, Dec. 26, 1987, 62-331476
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—51.3 6 Claims

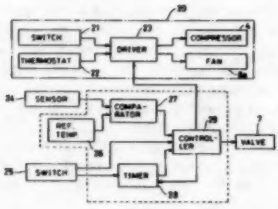


1. A refrigeration system comprising:
a compression portion having a volume to be varied;
a heat-accumulator fluidically connected to said compression portion;
a condenser fluidically connected to said heat-accumulator and having an upper side and a lower side;
an expansion portion fluidically connected to said condenser and having a volume to be varied, at which a very low-temperature is generated;
a vessel containing an amount of liquid helium and having a vapor phase of helium above said liquid helium, said condenser being external to said vessel;
a first conduit for connecting said vapor phase of helium in said vessel and said upper side of said condenser;
a second conduit for connecting said liquid helium in said vessel and said lower side of said condenser, whereby said vapor phase is condensed in said condenser and returned to said vessel.

4,891,952
FREEZER-REFRIGERATOR

Masaharu Yoshikawa, Kashihara; Kazuo Sugimoto, Osaka; Masuo Kamitaka, Nara; Shinya Takagi, Nara, and Hiroyuki Yoshida, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 29, 1988, Ser. No. 188,535
Claims priority, application Japan, Jul. 22, 1987, 62-184132; Oct. 20, 1987, 62-160682[U]; Nov. 17, 1987, 62-289900; Nov. 30, 1987, 62-304151; Dec. 8, 1987, 62-187049[U]; Dec. 15, 1987, 62-317755
Int. Cl.[4] F25B *5/00*; F25D *17/00*
U.S. Cl. 62—199 30 Claims

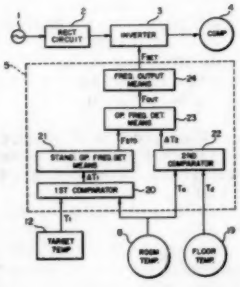


1. A refrigeration device comprising:
a compartment,
a refrigeration cycle comprising a compressor, a condenser, a first capillary tube and a first cooler connected with a refrigerant channel into a loop for circulating a refrigerant therethrough,
a quick freezing refrigerant circuit connected in parallel with the first cooler and comprising a second capillary tube and a second cooler connected in series therewith, the circuit having a junction for connection to the refrigerant channel from the first capillary tube to the first cooler,
a change-over valve provided in the refrigerant channel between the junction and the first cooler inclusive of the junction for changing a flow of the refrigerant toward the first cooler to a flow of the refrigerant toward the second cooler,
means for supplying air cooled by the first cooler to the compartment, and control means for driving the compressor, the means for supplying air and the change-over valve,
control means for driving the compressor, the fan and the change-over valve,
the second cooler being disposed within the compartment, the refrigerant being supplied to the first cooler for usual refrigeration to cool the compartment, the refrigerant being supplied to the second cooler for quick freezing to freeze an article to be frozen in contact with the second cooler,
said control means including,
a temperature sensor for detecting the temperature of the article,
a comparator for comparing the temperature of the article with a set value,
a timer, and
a controller for controlling the change-over valve based on the result of comparison by the comparator and the time measured by the timer, said controller controls the change-over valve so as to supply the refrigerant to the first cooler when the temperature of the article is not lower than a first set value, to supply the refrigerant to the second cooler when the temperature is between the first set value and a second set value which is lower than the first value, or to supply the refrigerant to the first cooler when the temperature is not higher than the second set value.

4,891,953
CONTROL DEVICE FOR AN AIR CONDITIONER WITH FLOOR TEMPERATURE SENSOR

Kazuaki Isono, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,560
Claims priority, application Japan, Feb. 1, 1988, 63-21515
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—209 9 Claims



1. A control device for an air conditioner, comprising:
first temperature sensor means for detecting a temperature

of a room conditioned by the air conditioner, at a level substantially higher than a floor level of the room;

second temperature sensor means for detecting a temperature of the room conditioned by the air conditioner, substantially at the floor level of the room;

target temperature setting means for setting a target temperature of the room conditioned by the air conditioner;

first comparator means, coupled to outputs of said target temperature setting means and said first temperature sensor means, for computing a difference between said target temperature and the room temperature detected by said first temperature sensor means;

second comparator means, coupled to outputs of said first and second temperature sensor means, for computing a difference between temperatures detected by said first and second temperature sensor means;

standard output power determining means, coupled to an output of said first comparator means, for determining a standard output power level of the air conditioner in accordance with said difference between the target temperature and the temperature detected by the first temperature sensor means; and

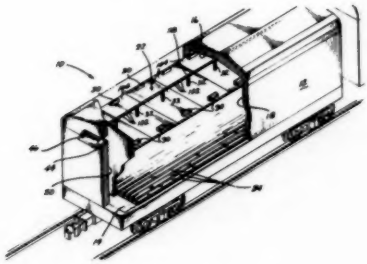
adjustment means, coupled to outputs of said standard output power determining means and said second comparator means, for determining an output power level to which the air conditioner is to be controlled, by making an adjustment to said standard output power level of the air conditioner, determined by said standard output power determining means, in accordance with said difference between temperatures detected by said first and second temperature sensor means.

4,891,954

REFRIGERATED CONTAINER

Van E. Thomsen, Enumclaw, Wash., assignor to Sheffield Shipping & Management Ltd., Barbados

Filed Jan. 19, 1989, Ser. No. 300,444
Int. Cl.[4] B60H *3/04*
U.S. Cl. 62—239 **9 Claims**



1. A refrigeration system utilizing a cryogenic refrigerant material, the refrigeration system comprising:

an insulated container having a floor, a ceiling, sidewalls, and end walls, said sidewalls defining the length and said end walls defining the width of said insulated container;

dividing means for partitioning said insulated container into an upper bunker and a lower storage area, said dividing means capable of supporting a supply of snow formed of a cryogenic material;

manifold means located in the upper regions of said bunker substantially along the longitudinal centerline of said bunker for forming cryogenic snow and distributing the formed cryogenic snow throughout said bunker;

a plurality of apertures extending through said dividing means adjacent said sidewalls and said end walls for permitting the flow of sublimated cryogenic gas from said bunker to said storage area, said apertures having a first peripheral housing extending substantially above said dividing means into said bunker;

at least one vent extending through said dividing means located substantially along the longitudinal centerline of said dividing means, said at least one vent having a second peripheral housing extending substantially above said dividing means into said bunker;

a plurality of channels extending substantially the entire length of said insulated container along said floor for collecting sublimated cryogenic gas; and

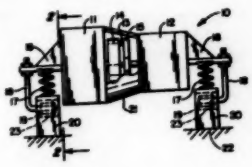
emission means communicating between said channels and the exterior of said insulated container for discharging the collected sublimated cryogenic gas to the atmosphere exterior to said insulated container.

4,891,955

ENGINE SUSPENSION SYSTEM

Thomas A. Klausing, Columbus, and Larry Schluer, Sugar Grove, both of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Mar. 14, 1989, Ser. No. 322,898
Int. Cl.[4] F25D *19/00*
U.S. Cl. 62—295 **6 Claims**



1. A heat pump system comprising:

(a) an internal combustion engine motive power source;

(b) a refrigeration compressor coupled to said internal combustion engine;

(c) rigid means interconnecting said internal combustion engine and coupled refrigeration compressor as a unit; and

(d) a plurality of compression spring means supporting said internal combustion engine and connected refrigeration compressor,

each said compression spring having a spring rate and a natural frequency under load which is substantially less than the lowest operating frequency of said internal combustion engine and connected refrigeration compressor.

4,891,956

INDICIA DEVICE

Sumner B. MacDonald, 39 Sea Breeze La., Bristol, R.I. 02809

Filed Dec. 19, 1988, Ser. No. 286,308
Int. Cl.[4] A44C *25/00*
U.S. Cl. 63—3 **8 Claims**

1. A jewelry charm comprising

an outer portion,

said outer portion including a rolled-over lip,

a spring member,

said spring member resiliently mating with said rolled-over lip, and

an insert,

said insert being configured to fit within said outer portion,

said insert including an integral protuberance,

said spring member including ends, said ends defining a gap,

said protuberance extending between said ends into said

gap, said ends thereby acting as circumferential stops for said insert,

wherein said insert is placed within said outer portion and said spring member is mated with said roller-over lip to removably retain said insert in said outer portion.

4,891,957

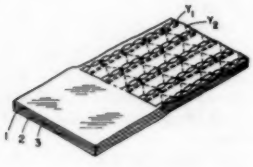
STITCHBONDED MATERIAL INCLUDING ELASTOMERIC NONWOVEN FIBROUS WEB

David C. Strack, Canton; Samuel C. Baer, Roswell; Diana M. Cates, Roswell, and Raju Venkatapathy, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 64,583, Jun. 22, 1987. This application Mar. 2, 1989, Ser. No. 319,520

Int. Cl.[4] D04B *23/08*

U.S. Cl. 66—192 **24 Claims**



1. A stitchbonded elastomeric nonwoven fibrous web capable of being stretched to a length that is at least about 125% of its relaxed length and having an air permeability of 5–150 cm^3/cm^2 S when measured in accordance with ASTM D 737.

4,891,958

DOUBLE KNIT FABRIC WITH HOLES THERETHROUGH AND KNITTED COLOR BANDS

Andre Cournoyer, Ste Rosalie; Serge Berard, and Denis Cote, both of St-Hyacinthe, all of Canada, assignors to Sport Maska Inc., St.-Hyacinthe, Canada

Continuation of Ser. No. 937,077, Dec. 2, 1986, Pat. No. 4,838,045. This application Apr. 18, 1989, Ser. No. 339,984 Claims priority, application Canada, Nov. 27, 1986, 523976

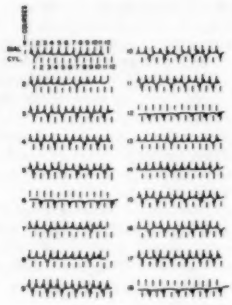
Int. Cl.[4] D04B *7/04*

U.S. Cl. 66—196 **14 Claims**

1. A fabric of double knit construction for use in a sports garment to allow control of body heat with respect to perspiration of the player wearing same, said fabric comprising:

a repeating pattern of at least four courses and two cylinder wales,

a first cylinder wale of said two cylinder wales including two consecutive courses having tuck stitches to form a hole, said pattern being repeated to form the fabric with a plurality of holes, a minimum spacing between adjacent holes formed by the consecutive tuck stitches including five cylinder wales in a horizontal direction within the same two consecutive courses as said tuck stitches, sixteen courses in a vertical direction within said first cylinder wale and one cylinder wale and four courses diagonally, and



a second cylinder wale of said two cylinder wales including three welt stitches and one knit stitch in the same at least four courses as said two consecutive courses with tuck stitches.

4,891,959

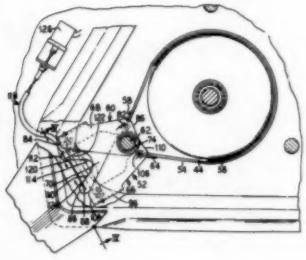
BI-DIRECTIONAL PIVOT BAND BRAKE FOR AUTOMATIC WASHER

Douglas E. Wood, Hagar Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 1, 1988, Ser. No. 214,592

Int. Cl.[4] D06F *37/40*

U.S. Cl. 68—23.7 **14 Claims**



1. An automatic washer having a vertical axis agitator, a concentrically mounted wash basket, a motor drivingly connected to said agitator and wash basket to selectively oscillate and rotate said agitator and basket about said vertical axis, and a brake mechanism to selectively prevent rotary movement of said tub, comprising:

a brake band frictionally engageable with a portion of said basket, said band having a first end and second end,

means for mounting said first and second ends to each be pivotally movable about a fixed common pivotable axis, and

means for moving said first and second ends about said pivotable axis relative to each other so as to tighten or loosen the engagement of said belt with said basket,

wherein said brake band will be equally effective in either direction of rotation of said basket.

4,891,960

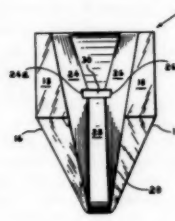
YARN FINISH APPLICATOR

Chandrakant S. Shah, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 148,584, Jan. 26, 1988, abandoned. This application Apr. 12, 1989, Ser. No. 337,132

Int. Cl.[4] D06B *1/08*

U.S. Cl. 68—200 2 Claims



1. In a yarn finish applicator that includes a body member having top, opposed side and front and back surfaces and a slot in the front surface running from top to bottom, said slot having bottom and side walls, and a passage connecting the back surface of the body member to the slot for supplying finish to said slot, the improvement comprising: said passage connecting said back surface of the body member to said slot by extending through the bottom wall of the slot and through a portion of each side wall adjacent said bottom wall, providing extensions to said passage, said extensions having a cross sectional area of at least 15 percent of the cross sectional area of the passage where it extends through said bottom wall.

4,891,961

KEY RING

Anton Tsamas, 408 Kaplan Ave., Hackensack, N.J. 07601

Filed Sep. 9, 1988, Ser. No. 242,941

Int. Cl.[4] A44B *15/00*

U.S. Cl. 70—456 R 11 Claims

1. A key ring comprising: a base, a slot formed in the base to define a plate and a first resilient shoulder integrally formed with said base, a second resilient shoulder integrally formed with said base, said shoulders being torsionally displaceable with respect to the base, a first arm extending from said first resilient shoulder and a second arm extending from said second resilient shoulder, said first arm and said second arm overlapping to form a loop, said first and second arms each having a free end, each said free end having an outer periphery that define the periphery of the loop when the loop is in a closed position, so that a positive pressure can be applied to said resilient shoulders to cause said second arm to be displaced apart from said first arm at the overlapping portion to permit a key to be removed from the loop.

4,891,962

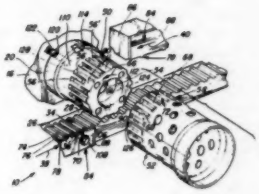
ROLL FORMING NOTCHES IN A THIN-WALL POWER TRANSMISSION MEMBER

Carl Anderson, Mt. Clemens, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Division of Ser. No. 263,396, Oct. 27, 1988, which is a division of Ser. No. 88,696, Aug. 21, 1987, Pat. No. 4,819,468. This application Jan. 27, 1989, Ser. No. 302,374

Int. Cl.[4] B21H *5/00*

U.S. Cl. 72—88 5 Claims



1. A mandrel (50) for forming a power transmission member (52) from a blank having a thin walled annular sleeve portion (58), said mandrel comprising: a central axis (54); mounting means (20) for maintaining said mandrel (50) on an apparatus (10) for rotation about said central axis (54) between the work surfaces (34) of a pair of die members (26,30); a body portion (110) for receiving and supporting the sleeve portion (58) of the blank thereover; and a work surface (56) generated around said central axis (54) for cooperating with the work surfaces (34) of the pair of die members (26,30) to form a transmission member (52) from the blank during a forming operation, said work surface including at least one recess (80) therein for cooperating with at least one notch forming projection (70) on the die members (86) to form a notch (72) in the bank during the forming operation, said work surface including a plurality of spline forming teeth (56) for cooperating with the spline forming teeth (36) on the die members (26,30) to form splines (68) in the blank, and at least one tooth (56') including said recess (80) along at least a portion of the length thereof and with said recess (80) further spaced between adjacent spline forming teeth (56).

4,891,963

WIRE ROD ROLLING MILL

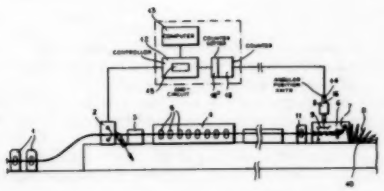
Manfred Reumann, Neuss-Wulmstorf, Fed. Rep. of Germany, assignor to Hamburger Stahlwerke GmbH, Hamburg, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 239,213

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730745

Int. Cl.[4] B21B *1/00*

U.S. Cl. 72—203 7 Claims



1. A wire rolling mill for making wire comprising a plurality of roughing stands, a cropping shears, a finishing block, a coiler with a coiler pipe and a coiler drive comprising a coiler

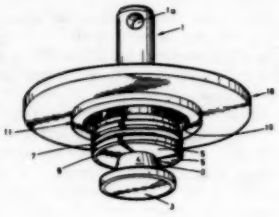
motor and a coiler gear unit, a delivery conveyor for said wire which has been completely rolled into coils, said roughing stands, said cropping shears, said finishing block, said coiler and said delivery conveyor being arranged in succession in the wire running direction, and also comprising a controller with a computer, in which said computer controls said shearing unit defined in a predetermined rolling program by a computer shear command and said shearing unit cuts away a cropped length defined in said computer shear command from the leading end of a rolled wire rod workpiece prior to feeding said rolled wire rod workpiece to said finishing block, and thereby produces a wire head of said wire deposited in a coil, said cropped length being correlated with the coiler pipe, position, said wire coiler having a rotation angle position transmitter operating with a plurality of digital pulses, which is connected with said controller and whose angular position corresponds to said coiler pipe position, said controller combining said computer shear command and said digital pulse of a presettable coiler pipe position sector by an electronic AND-circuit into a shear positioning command and said cropping shears responds to said shear positioning command.

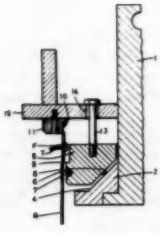
4,891,964

TOOL FOR THE FINAL FORMING OF CONNECTOR PIPES

Carl O. Hallström, Nilden, Sweden, assignor to C. Hallstroms Verkstader AB, Sweden

Filed Jan. 4, 1988, Ser. No. 140,773
Int. Cl.[4] B21D *39/00, 41/04*
U.S. Cl. 72—308 **5 Claims**





1. Apparatus for working a connector pipe to clamp a seal ring into a recess in said connector pipe and to form an end portion of said connector pipe, comprising:

a rod extending along a longitudinal axis from a first end to an opposite second end, said rod being reciprocable along said longitudinal axis relative to a calibration ring;

a calibration ring extending about said longitudinal axis and about said rod and having an inner forming surface facing said longitudinal axis;

a cone-shaped surface at said opposite second end of said rod for reciprocable movement with said rod along said longitudinal axis relative to said calibration ring, said cone-shaped surface facing away from said longitudinal axis and increasing in diameter towards said opposite second end, said cone-shaped surface including a flange extending in a radial direction away from said longitudinal axis at said opposite second end,

a plurality of form chucks extending radially about said rod and said longitudinal axis, each form chuck being in the shape of a circular segment, each form chuck of said plurality of form chucks having (a) an inner inclined surface facing said longitudinal axis for engagement with and sliding movement relative to said cone-shaped surface, and (b) an outer surface projecting radially away from said longitudinal axis, each form chuck including a lower surface for engagement with and sliding movement relative to said flange,

resilient means engaging said plurality of form chucks for retaining each form chuck in position relative to said rod;

said plurality of form chucks being moveable radially and in the direction of said longitudinal axis towards said calibration ring to so work said connector pipe therebetween when each inner inclined surface is caused to engage and slide relative to said cone-shaped surface as said rod and said cone-shaped surface are moved vertically along said longitudinal axis in a direction towards said calibration ring,

a plate having an aperture therethrough, said calibration ring being affixed to a first side of said plate, and said rod extending through said aperture from said first side such that said cone-shaped surface, and said plurality of form chucks, are on the same side of said plate as said calibration ring, and

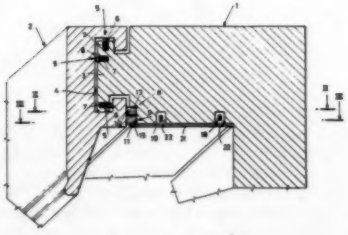
a respective screw extending from an opposite second side of said plate through a respective enlarged aperture in said plate, said respective screw being threaded into a respective form chuck to support said respective form chuck in the vicinity of said first side of said plate, each respective screw being of a length for longitudinal axial movement thereof with each respective form chuck and said rod, and relative to said calibration ring, during said working of said connector pipe.

4,891,965

SYSTEM FOR CONNECTING A BENDING BLADE TO ITS CORRESPONDING SUPPORT IN A SHEET METAL PANEL BENDING MACHINE

Dario Piacentini, Lonigo, Italy, assignor to Salvagnini Transferica S.p.A., Sarego, Italy

Filed Jun. 23, 1988, Ser. No. 210,505
Claims priority, application Italy, Jun. 25, 1987, 21045 A/87
Int. Cl.[4] B21D *37/14*
U.S. Cl. 72—481 **2 Claims**



1. System for connecting a bending blade to its corresponding support in a bending machine for sheet metal panels, comprising:

slack connecting means between the blade and the support,

elastic means for taking up slack between said blade and support in a direction of application of operating forces, and

means for defining a face of the support with a variable length which reacts rigidly against a component of bending force in a direction parallel to a plane of a sheet metal panel and perpendicular to a bending line, said means include a pair of superimposed rods sliding in reciprocally inverse directions in the direction of the bending line in corresponding seats with a differentiated section obtained in said support, each seat being formed by at least two consecutive segments of different depths which determine different degrees of reaction of the corresponding rod to the bending force applied to the corresponding parts of the blade, shallower segments of the two seats being symmetrically opposite with respect to a median vertical axis of said support and being superimposed one over the other in a central part of the support, and there being also means for reciprocal movement of said rods in order to to vary in a corresponding manner an extension of their parts coinciding with the shallower segments of their seats and consequently an extension of the central part of the support which reacts rigidly to said component of the bending force.

4,891,966

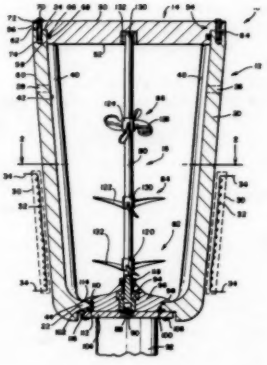
PROCESS AND APPARATUS FOR MEASUREMENT OF VOLATILE RESIDUALS

Anatoly I. Kramer, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 291,710, Dec. 29, 1988, abandoned. This application Jun. 5, 1989, Ser. No. 363,361

Int. Cl.[4] G01N *7/14*

U.S. Cl. 73—19 **23 Claims**



1. A process for measuring volatile residuals in a solid material, said process comprising:

providing particles of said solid material having a volatile residual material retained within said particles,

repeatedly reducing the size of said particles in a hermetically sealed chamber and liberating said volatile residual material as a gas within said chamber; and

removing a sample of said gas from said hermetically sealed chamber and analyzing said sample and providing a measure of said gas residual.

4,891,967

METHOD AND APPARATUS FOR DETERMINING THE AVERAGE FINENESS OF LOOSE FIBRES

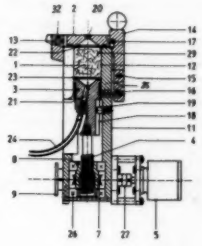
Horst-Dieter Vogt, Hochstrasse 36, 8044 Zurich, Switzerland

Filed Oct. 4, 1988, Ser. No. 253,536

Claims priority, application Switzerland, Oct. 6, 1987, 3895/87

Int. Cl.[4] G01N *15/08*

U.S. Cl. 73—38 **11 Claims**



1. A method for determining the mean fineness of loose fibres, wherein a measuring chamber (1) is filled with a fibre sample (29) and then an air stream is conducted through the measuring chamber, and the effect of the fibres on the air stream is measured and from this measurement, the fineness of the fibres is calculated as a function of the volume of the measuring chamber, characterised in that, before the air stream is conducted through, the fibre sample (29) in the measuring chamber (1) is compressed by displacing at least one chamber wall with a constant force, and in that the chamber volume in the compressed state is measured separately for each fibre sample.

4,891,968

PROCESS FOR THE DETERMINATION OF THE CONCENTRATION OF SUBSTANCES DISSOLVED IN A SOLVENT BY MEANS OF OSMOTIC CELLS

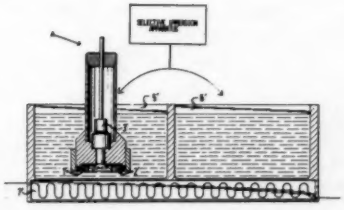
Ernst Steudle, Eckersdorf; Gerd Bölling, Inden-Pier, and Josef Zillikens, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,360

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706361

Int. Cl.[4] G01N *13/04*

U.S. Cl. 73—64.3 **22 Claims**



1. A process for testing a test solution, said test solution comprising a solvent, and at least one of a first substance dissolved in said solvent and a second substance dissolved in said solvent, said test solution having an approximate expected concentration of said first substance and an approximate expected concentration of said second substance, said process comprising the steps of:

(a) providing a first osmotic membrane, said first osmotic membrane having differing and distinct permeabilities with respect to said solvent, said first substance and said second substance, said first osmotic membrane being significantly more permeable with respect to said solvent than with respect to said first substance, and said first osmotic membrane being significantly more permeable with respect to said first substance than with respect to said second substance;

(b) exposing a first side of said first osmotic membrane to an osmometer solution, said osmometer solution having concentrations of said first and second substances which differ from said approximate expected concentrations of said first and second substances of said test solution, respectively, by not more than a first predetermined difference;

(c) exposing the second side of said first osmotic membrane to a reference solution, said reference solution having a concentration of said second substance which differs from said concentration of said second substance of said osmometer solution by not more than a second predetermined difference;

(d) determining a working pressure, P_O, existing on said first side of said first osmotic membrane exposed to said selected osmometer solution while said second side of said first osmotic membrane is exposed to said reference solution;

(e) replacing said reference solution with said test solution

(f) thereafter, determining at least one pressure change characteristic of said osmometer solution; and

(g) using said at least one determined pressure change characteristic of said osmometer solution to determine at least one of said concentrations of said first and second substances in said test solution.

4,891,969

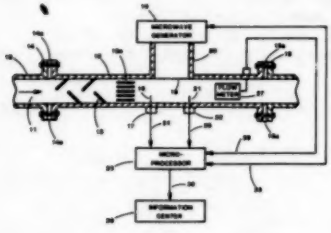
OIL/WATER RATIO MEASUREMENT

J. Robert Wayland, 580 Oakwood Pl., N. E., Albuquerque, N. Mex. 87123, and Caroline H. Persson-Reeves, 1013 Lynch Ct. N. W., Albuquerque, N. Mex. 87104

Filed Jul. 7, 1988, Ser. No. 216,073

Int. Cl.[4] G01N *25/58*; G01F *5/00*

U.S. Cl. 73—61.1 R **25 Claims**



1. A method for measuring the ratio of components with different properties in a fluid mixture of those components flowing through a conduit comprising the steps of:

(a) measuring the temperature of a fluid mixture in the conduit;

(b) measuring the flow rate of the mixture in the conduit;

(c) heating the fluid mixture by applying a microwave field to the mixture within the conduit;

(d) measuring the temperature of the mixture in the conduit after it has been heated;

(e) measuring the power input of the microwave field; and

(f) determining the ratio of components present in the mixture.

4,891,970

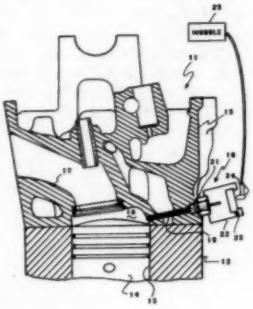
LUMINOSITY DETECTOR FOR INTERNAL COMBUSTION ENGINE, METHOD OF OPERATING ENGINE AND METHOD OF SENSING TEMPERATURE

Donald J. Remboski, Jr., Northborough, Mass., assignor to Barrack Technology Limited, Marlborough, Mass.

Filed Dec. 6, 1988, Ser. No. 280,595

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—116 **7 Claims**



1. In a luminosity detector for an internal combustion engine having a combustion chamber, light probe means in said combustion chamber for transmitting light from said combustion chamber through a body of said engine defining at least in part said combustion chamber, a photodiode fixed relative to said body and in light receiving relationship to said light probe to receive light therefrom and generate an electrical signal for transmission to an electrical module for providing engine operating data, the improvement comprising said photodiode being manufactured and biased to operate within the range of zero temperature coefficient for the wavelength being measured by said detector.

4,891,971

ENGINE MONITORING APPARATUS

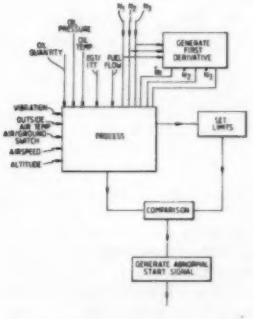
John W. D. Jones, Nympsfield, and Peter F. O'Sullivan, Cheltenham, both of England, assignors to Smiths PLC, London, England

Filed Dec. 21, 1988, Ser. No. 287,238

Claims priority, application United Kingdom, Dec. 23, 1987, 8729962

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.3 **11 Claims**



1. Engine monitoring apparatus for detecting abnormal start conditions of a gas-turbine engine comprising: means for deriv-

ing a first signal indicative of spool speed; means for deriving a second signal indicative of engine temperature ; processing means arranged to receive the first and second signals, said processing means monitoring the dynamic relationship between the first and second signals such as to determine when the said relationship is indicative of an abnormal start condition ; and visual display means which signals in real time a visual indication of such an abnormal start condition.

4,891,972

ULTRASONIC JOINT INSPECTION DEVICE AND METHOD

Takashi Kawaguchi, Ageo; Yoshiaki Fujita, Omiya, and Satoshi Kawai, Tochigi, all of Japan, assignors to Nippon Piston-Ring Co., Ltd., Tokyo, Japan

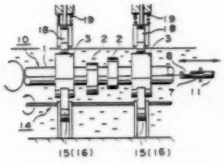
Continuation of Ser. No. 113,354, Oct. 28, 1987, Pat. No. 4,817,420, which is a continuation of Ser. No. 873,948, Aug. 20, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 254,168

Claims priority, application Japan, Jun. 14, 1985, 60-127979

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 R **4 Claims**



1. An ultrasonic joint inspection device for inspecting a joint between a hollow shaft and a piece joined to an outside surface of the hollow shaft of a composite camshaft, said device comprising:

a probe having means for generating ultrasonic waves and means for detecting ultrasonic waves;

a mirror positioned in front of said probe in a pathway of said ultrasonic waves generated from said probe for deflecting said ultrasonic waves;

a sub-probe positioned outside said composite camshaft so as to correspond in position to said mirror in an axial direction of said hollow shaft and operatively coupled to said probe so as to move together with said probe and said mirror;

support means for supporting and aligning said probe and said mirror;

guide means for supporting, positioning and aligning an assembled structure of said support means, said probe and said mirror within and out of engagement with an inner peripheral surface of the hollow shaft whereby a precise, fixed distance is maintained between said mirror and the joint being examined during the rotation of the hollow shaft about the inspection device; and

camshaft support means for supporting and rotating the camshaft being inspected, said camshaft support means comprising:

a first roller and a second roller rotatably mounted to a support;

a third roller positioned above said first roller and said second rollers;

biasing means for biasing said third roller against an outer peripheral surface of the hollow shaft during rotation of the hollow shaft about said probe;

drive means for driving said rollers for rotating the hollow shaft; and

means for moving said probe along a longitudinal axis of the hollow shaft for providing scanning of the entire joint.

4. An ultrasonic joint inspection device for inspecting a joint between a hollow shaft and a piece joined to an outside surface of the hollow shaft of a composite camshaft, said device comprising:

a tank filled with a coupling liquid;

an ultrasonic probe having means for generating and detecting ultrasonic waves from within the hollow shaft for inspecting the joint;

an ultrasonic sub-probe having means for generating and detecting ultrasonic waves from outside the hollow shaft for determining a position of said probe, said sub-probe being operatively coupled to said probe so as to move together with said probe in an axial direction of the hollow shaft; and

camshaft support means for supporting and rotating the camshaft being inspected within said coupling liquid, said camshaft support means comprising:

a first roller and a second roller rotatably supported within said tank;

a third roller positioned above said first roller and said second roller;

biasing means for biasing said third roller against an outer peripheral surface of the hollow shaft during rotation of the hollow shaft about said probe; and

drive means for driving said rollers for rotating the hollow shaft.

4,891,973

CIRCUIT ARRANGEMENT FOR TRANSMITTING MEASUREMENT VALUES ON VEHICLE WHEELS

Lothar Bollweber, Steinmauern; Walter Jansche, Durmersheim; Robert Hugel, Karlsruhe; Claus-Dietrich Pilch, Remchingen; Manfred Rothley, Kraichtal, and Erich Zabler, Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

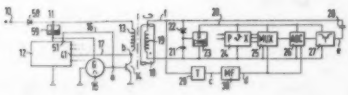
PCT No. PCT/DE86/00523, § 371 Date Jun. 9, 1988, § 102(e) Date Jun. 9, 1988, PCT Pub. No. WO87/04123, PCT Pub. Date Jul. 16, 1987

PCT Filed Dec. 24, 1986, Ser. No. 221,464

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1986, 3600260

Int. Cl.[4] B60C *23/04;* **H03K** *6/02;* **H05F** *3/00;* **G08C** *15/12*

U.S. Cl. 73—146.5 **10 Claims**



1. Circuit arrangement for transmitting variable measurement values, such as pressure and temperature, at vehicle wheels, comprising a repeater coil which is arranged at the vehicle in the vicinity of the wheel so as to be stationary and which is connected, on the one hand, to a square-wave generator (**15**) for supplying energy to a sensor circuit arrangement which revolves with the vehicle wheel and, on the other hand, to an evaluating circuit for transmitting measurement values in the voltage pauses of the square-wave generator (**15**), and comprising a revolving repeater coil which is fastened at the vehicle wheel, cooperates with the stationary repeater coil and is connected with the sensor circuit arrangement at the vehicle wheel for supplying energy on the one hand and for transmitting the measurement values on the other hand; the sensor circuit arrangement comprises a measurement value converter which transmits the measurement values produced by at least one sensor to the repeater coil in the form of H-F signals in the voltage pauses of the square-wave generator and whose frequency is a multiple of the frequency of the square-wave generator, characterized in that the sensor circuit arrangement (**20**) also contains a timing element (**29**) which responds to a voltage peak (Ui) in the revolving repeater coil (**19**) produced

by means of the end of a voltage pulse (Ua) at the square-wave generator (15) and which triggers a timing circuit (30) with a corresponding delay time (T1) for transmitting the measurement values, which timing circuit (30) is connected with it on the output side, wherein the delay time (T1) of the timing element (29), together with the duty cycle (T2) of the timing circuit (30), is shorter than the pause time (t2) of the square-wave voltage at the square-wave generator (15).

4,891,974

METHOD AND APPARATUS FOR DETERMINING CHARACTERISTICS OF STAPLE FIBER YARNS

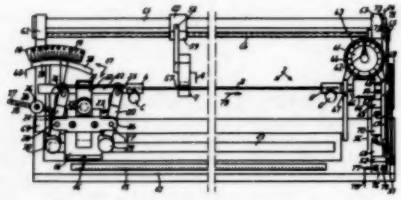
Heinz-Georg Wassenhoven, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 249,349

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732513

Int. Cl.[4] G01L *5/04*

U.S. Cl. 73—160 **26 Claims**



1. Method for measuring and testing of staple fiber yarn, comprising:

measuring the diameter of a staple fiber yarn segment having a predetermined twist;

manipulating said segment to change the twist thereof; re-measuring the diameter of said segment after said manipulating; and

comparing the measured diameters to determine characteristics of said segment.

4,891,975

METHOD AND APPARATUS FOR REMOTE MONITORING OF VALVES AND VALVE OPERATORS

Arthur G. Charbonneau, Marietta; Stanley N. Hale, Rome, and Edmond A. Sayed, Marietta, all of Ga., assignors to Movats Incorporated, Marietta, Ga.

Continuation of Ser. No. 848,451, Apr. 4, 1986, Pat. No. 4,831,873. This application Dec. 1, 1988, Ser. No. 278,977

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—168 **5 Claims**

1. Method for monitoring the condition of a valve and valve operator to signal a need for maintenance of the valve or valve operator, said method comprising the steps of:

imposing a thrust load in the valve operator during a calibration period;

measuring the thrust load imposed in the valve operator;

measuring a power parameter of the valve operator during imposition of the thrust load;

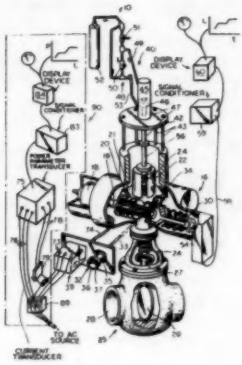
calibrating thrust load to the power parameter;

ending the imposing of thrust load in the valve operator during the calibration period;

placing the valve and valve operator in use;

measuring the power parameter of the valve operator during valve-in-use generation of thrust load in the valve operator; and

correlating the power parameter measured during imposition of the load with the power parameter measured dur-



ing valve-in-use to provide an indication of thrust load developing in the valve operator during valve-in-use.

4,891,976

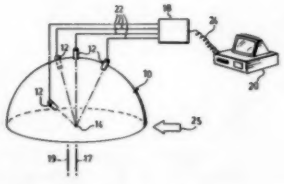
DEVICE EMPLOYING RESONANT CHAMBERS TO DETERMINE WIND CHARACTERISTICS

John D. Chato, 1412-1450 Chestnut St., Vancouver, B.C., Canada V6J-3K3

Filed Apr. 7, 1988, Ser. No. 178,914

Int. Cl.[4] G01W *1/04*

U.S. Cl. 73—189 **9 Claims**



1. Apparatus for determining wind characteristics, comprising:

frame means

means defining a plurality of resonant chambers, each with a mouth opening such that wind blowing across the opening at an appropriate speed and direction causes air within the respective chamber to resonate and create a sound, the chambers and mouth openings being at different angles and orientations so as to correspond to hemispherical radii distributed at intervals no greater than about 10°,

a sound detecting unit associated with each resonant chamber and producing a signal when its respective chamber is resonating,

and interpretative means for continuously sampling the output from all said sound detecting units, and for calculating from said sampled outputs the compass direction, the inclination to the horizontal and the speed range of the wind.

4,891,977

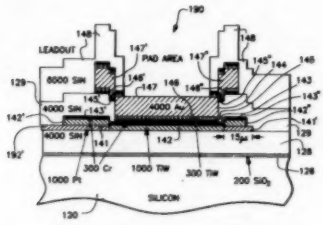
MICROBRIDGE SENSOR BONDING PAD DESIGN FOR IMPROVED ADHESION

Robert G. Johnson; James O. Holmen, both of Minnetonka, and Jeffrey A. Ridley, Burnsville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 16, 1988, Ser. No. 285,272

Int. Cl.[4] G01F *1/68*; H01C *17/28, 1/102*

U.S. Cl. 73—204.26 **14 Claims**



8. A high adhesion bonding pad fabricated on the silicon nitride surface of a semiconductor microbridge sensor in which the sensing metal per se, does not make a strong adhesion bond to the silicon nitride comprising:

a thin film of silicon nitride on the surface of a semiconductor substrate, said Si_3N_4 having a smooth surface;

a bonding pad area on said silicon nitride;

a sensor metal deposited to said Si_3N_4 surface away from said bonding pad area, said sensor metal having a termination in the edge of said bonding pad area, said sensor metal having been annealed to stabilize the sensor;

a bonding site within said bonding pad area spaced laterally from said sensor metal;

a thin film layer of an adhesion promoting metal selected from the group consisting of Cr and Ti:W deposited on the Si_3N_4 at the bonding site and also onto said sensor metal termination;

a thin film layer of dielectric material deposited over said sensor metal, said adhesion promoting metal and said bonding pad area;

a via extending through said dielectric film at said bonding site exposing the underlying adhesion promoting metal at the site;

another thin film layer of the adhesion promoting metal deposited into said via on said site; and

a thin film layer of gold deposited into said via on said adhesion promoting metal.

4,891,978

APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM AND METHOD FOR PRODUCING AN APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

Jaihind S. Sumal, Vaihingen-Ensingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

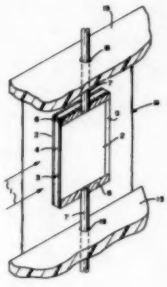
Division of Ser. No. 585,093, Mar. 1, 1984, Pat. No. 4,826,328. This application Feb. 8, 1989, Ser. No. 307,724

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315704

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204.26 **4 Claims**

1. A device for measuring the mass of a flow medium of an intake tube of an internal combustion engine, which comprises a substrate with parallel faces having a leading edge and a trailing edge, a resistor layer covering a major portion of at least one face of said substrate with said resistor layer extending from said leading edge toward said trailing edge, with a portion of said substrate extending along said trailing edge thereof free of said resistor layer, means for supporting said



substrate in said intake tube with said trailing edge positioned down-stream in said flow medium.

4,891,979

GAS METER HAVING A SYNTHETIC DIAPHRAGM AND MOLDED HOUSING

André De Régo, Antony, France, assignor to Schlumberger Industries, S.A., Montrouge, France

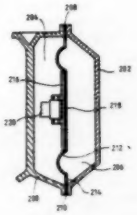
Continuation of Ser. No. 828,414, Feb. 11, 1986, Pat. No. 4,779,459. This application Oct. 20, 1988, Ser. No. 260,344

Claims priority, application France, Feb. 12, 1985, 85-01931

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] G01F *11/08, 15/16*

U.S. Cl. 73—269 **9 Claims**



1. gas flow meter having a deformable membrane responsive to gas flow, the improvement comprising:

a housing made of thermoplastic material having an inside wall and defining two measuring chambers; and

said deformable membrane disposed in said housing between said chambers;

said membrane being made of a complex comprising a film of non-vulcanizable thermoplastic elastomer material disposed opposite to one face of a synthetic fiber structure of substantially constant thickness, said elastomer material adhering to said film structure and covering said face of the film structure;

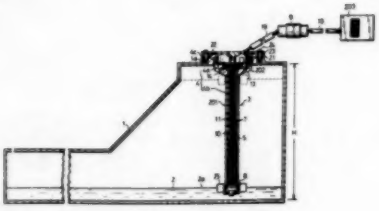
said membrane further including a periphery which is fixed to said inside wall by hot-welding to form a gas-tight seal between the periphery of said membrane and said inside wall.

4,891,980

LIQUID LEVEL GAUGE

Makoto Kawai; Chikahisa Hayashi; Yoshikazu Hirose, and Tatsuya Terayama, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 26, 1988, Ser. No. 199,154
Claims priority, application Japan, May 26, 1987, 62-129531
Int. Cl.[4] G01F *23/76*; G01R *33/00*
U.S. Cl. 73—290 R 11 Claims



1. A liquid level gauge, comprising:

a core extending in the vertical direction and disposed inside a liquid container having a cross sectional configuration varying in the vertical direction, said core being isolated from the liquid,

a coil wound in the direction of the length of said core, said coil comprising a densely wound portion formed at one end of said core, and a thinly wound portion formed on the remaining portion of said core,

a conductor ring disposed around the outer circumference of said coil and movable in the direction of the length of said coil according to the liquid level inside said container,

detecting means for detecting the change in the inductance of said coil according to the displacement of said conductor ring,

transforming means for transforming said change in the inductance of said coil into a change in an electric signal, and

display means for displaying the quantity of the liquid inside said container, corresponding to said electric signal,

said thinly wound portion having a winding density varying in steps along the direction of the length of said core,

said display means being made to display a display value proportional to the change in the quantity of the liquid inside said container,

said core being a cylindrical body formed by spirally rolling a sheet of silicon steel that is coated on both sides with an inorganic insulating film.

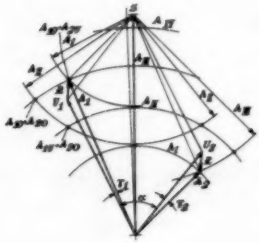
4,891,981

METHOD FOR DETERMINING THE POSITION AND MAGNITUDE OF UNBALANCE CORRECTION

Harald Schonfeld, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,562
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715499
Int. Cl.[4] G01M *1/16, 1/22*
U.S. Cl. 73—460 4 Claims

1. In a method for determining the position and magnitude of a correction in correction planes for the purpose or reducing a determined unbalance in a body whereby incremental correction is provided with respect to magnitude and continuous correction is provided with respect to position, the improvement comprising the steps of defining unbalance of a body in correction planes according to magnitude and position, determining the influence of several corrections for each correction plane upon static and dynamic residual unbalance through two correction weight increments which are closest to the defined unbalances per correction plane, forming combinations of the two correction weight increments per correction plane, the resultant of which corresponds to the resulting unbalance, defining a difference between each combination and the unbalance in one of the two correction planes, determining the one combination that shows the smallest difference, and when the difference is not larger than the residual unbalance permissible



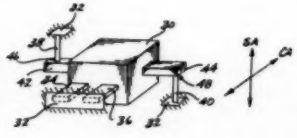
for each correction plane, utilizing the one combination as correction in the one correction plane, and selecting those corrections in each correction plane which represent the minimal possible static residual unbalance and the residual unbalance of which, per correction plane, lies within predetermined limits.

4,891,982

TEMPERATURE COMPENSATION OF A STEADY-STATE ACCELEROMETER

Brian L. Norling, Mill Creek, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 879,262, Jun. 27, 1986, Pat. No. 4,750,363. This application Jun. 10, 1988, Ser. No. 205,194
The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—497 12 Claims



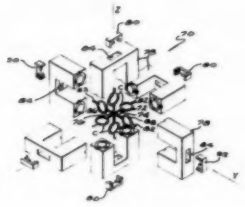
1. An accelerometer for measuring acceleration along a sensitive axis, the accelerometer comprising a housing, a proof mass, support means for mounting the proof with respect to the housing, and first and second force transducers each of which has a DC frequency response, each force transducer being connected between the proof mass and the housing such that an acceleration along the sensitive axis results in a compression force on one force transducer and a tension force on the other force transducer and such that differential thermal expansion or contraction between the force transducers and the other accelerometer components results in rotation of the proof mass about a compensation axis normal to the sensitive axis.

4,891,983

INDUCTIVELY COUPLED FORCE BALANCE INSTRUMENT

Robert E. Stewart, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 4, 1988, Ser. No. 228,360
Int. Cl.[4] G01P *15/11, 15/13*
U.S. Cl. 73—517 B 13 Claims



1. An inductively coupled force balance instrument comprising:

an instrument body;

a sensitive element having a shorted coil of conductive material associated with said body for relative movement in response to acceleration of the body;

means for generating a primary magnetic flux intersecting the shorted coil; and

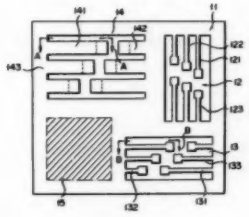
means for inducing within the shorted coil a current which interacts with said primary magnetic flux to generate a force opposing said movement.

4,891,984

ACCELERATION DETECTING APPARATUS FORMED BY SEMICONDUCTOR

Tetsuo Fujii, Toyohashi, and Osamu Itoh, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 8, 1986, Ser. No. 917,103
Claims priority, application Japan, Oct. 8, 1985, 60-224066
Int. Cl.[4] G01P *15/12*
U.S. Cl. 73—517 R 5 Claims



1. An acceleration detecting apparatus formed by a semiconductor comprising:

a semiconductor substrate having a front and a back surface;

acceleration detecting means including first, second and third movable members located in first, second and third frames respectively, said frames being formed by cutting said substrate from the front and the back surface, each of said movable members being formed of a plurality of beams which are made by cutting said substrate from the front and back surface, each of said beams being a cantilever extending parallel to the front and back surfaces of said substrate and having a movable portion, the beams formed in said first frame being capable of vibrating an X-axis direction parallel to the front and back surfaces of said substrate, the beams formed in said second frame being capable of vibrating in Y-axis direction also parallel to the surfaces of said substrate, and the beams formed in said third frame being capable of vibrating in Z-axis direction perpendicular to the front and back surface of said substrate; and

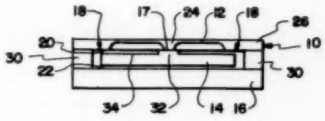
first, second and third piezo resistance means formed at the movable portions of said beams, respectively, and each having a resistance which varies in response to a bending degree of the beam, thereby generating an electrical signal corresponding to the resistance thereof.

4,891,985

FORCE SENSOR WITH ATTACHED MASS

Max C. Glenn, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 757,714, Jul. 22, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 920,899
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R 3 Claims



1. A sensor comprising:

a die having a central region, a peripheral support, and a flexible annular sensing portion, the annular sensing portion being less thick than the central region and the peripheral support, the annular sensing portion being located between the central region and the peripheral support;

a housing having an interior surface and including a spacing means, wherein the spacing means is attached to the peripheral support of the die and to the interior surface to thereby rigidly space the interior surface away from the peripheral support of the die; and

mass means for enhancing the sensitivity of the die and for limiting the movement of the annular sensing portion of the die, the mass means being rigidly attached to the central region of the die, the mass means having a thickness and configuration permitting it to move between rigid limits formed by the peripheral support of the die and the interior surface of the housing.

4,891,986

APPARATUS FOR INSPECTING ARTICLES

Paul Teagle, Surrey, England, assignor to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 222,285, Jul. 21, 1988, abandoned, which is a continuation of Ser. No. 65,758, Jun. 24, 1987, abandoned. This application May 16, 1989, Ser. No. 352,626
Claims priority, application United Kingdom, Jun. 24, 1986, 8615433; Aug. 15, 1986, 8619911
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—634 22 Claims

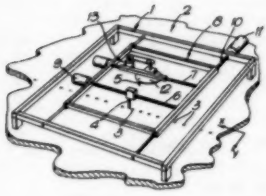
1. Apparatus for locating the geometrical center of a symmetrically shaped bore in a material comprising:

detector means, distinguishably responsive to a property of said material for providing a signal output indicative of said property;

bore traversing means, on which said detector means is mounted, for moving said detector means adjacent said material along a raster scan path; and

first means, operatively connected to said detector means and to said bore traversing means, and responsive to changes in said signal output of said detector means as said bore traversing means is scanned across a bore in two

mutually orthogonal directions, for determining a position of said bore by detecting edges of said material and determining coordinates of two mutually perpendicular



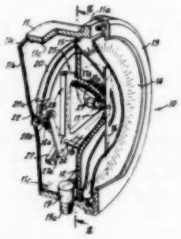
scanned chords across said bore and calculating coordinates of the center of said bore from said coordinates of said chords.

4,891,987

MAGNETIC LINKAGE FOR BOURDON TUBE GAUGES

William E. Stockton, 16721 SW. 299th St., Homestead, Fla. 33030, and Harold E. Stockton, 24 Veenstra Rd., Houston, Tex. 77022

Filed Nov. 25, 1988, Ser. No. 275,943
Int. Cl.[4] G01L *7/04*
U.S. Cl. 73—732 **16 Claims**



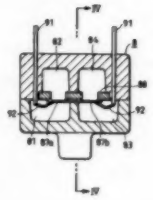
12. A Bourdon tube pressure gauge comprising a tubular casing having a transverse wall dividing the casing into front and rear compartments, a Bourdon tube mounted at one end on said casing in said rear compartment and having an opposite free end adapted to move radially outwardly and inwardly a relatively short distance in response to pressure changes within said Bourdon tube, a movement amplifying mechanism located in said rear compartment for converting the relatively short radial movement of said Bourdon tube free end to the rotary motion of a shaft on which a pointer is mounted for indicating pressure values on a circular dial, said movement amplifying mechanism comprising a rack segment pivotally mounted for acute angular movement and a pinion mounted on said shaft, a linkage connecting said Bourdon tube free end to said rack segment for pivoting the latter in response to said Bourdon tube free end movement, said rack segment having an arcuate band carrying magnetic means, said pinion having complementary magnetic means located for operative magnetic engagement with said rack segment magnetic means whereby pivotal rotation of said rack segment by said Bourdon tube free end movement rotates said pinion and shaft for predetermined pressure indication on said dial by said pointer, a rear closure plate for said rear compartment mounted on said casing, said casing, Bourdon tube, rear closure plate, rack segment, linkage and shaft being made of a non-magnetic material, and said rear compartment having a lining of magnetic flux barrier material to isolate said arcuate band magnetic means and pinion complementary magnetic means from external magnetic interference.

4,891,988

VORTEX FLOWMETER

Yasuo Tada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,488
Claims priority, application Japan, Mar. 1, 1988, 63-27667[U]
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 **2 Claims**



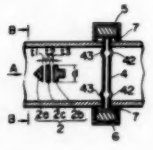
1. A vortex flowmeter, comprising: a first pressure conduit for transmitting the variation of pressure due to a Karman vortex in a conduit, through which fluid to be detected flows, to a first and a fourth pressure chambers, a second pressure conduit for transmitting a variation of vortex pressure to a second and a third pressure chambers, a first and a second diaphragms provided in a partition wall portion between said first and said second pressure chambers and a partition wall portion between said third and said fourth pressure chambers, respectively, a first and a second bridge circuits formed on said first and said second diaphragms, respectively, and a differential amplifier circuit for amplifying a difference of output between said first and said second bridge circuits.

4,891,989

VORTEX FLOW METER

Masao Misumi, and Koji Atsumi, both of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 24,294, Mar. 10, 1987, Pat. No. 4,838,092. This application Dec. 13, 1988, Ser. No. 283,656
Claims priority, application Japan, Mar. 15, 1986, 61-037995; Mar. 15, 1986, 61-037996; Mar. 16, 1986, 61-037828; Mar. 16, 1986, 61-057766; Mar. 17, 1986, 61-058975; Nov. 19, 1986, 61-178079
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 **6 Claims**



1. A vortex generator for measuring fluid flow in an elongated conduit having a central axis, comprising an upstream vortex generator and a generally T-shaped downstream vortex generator disposed transversely in said conduit, said upstream vortex generator having an upstream side and a downstream base side, said downstream vortex generator having a downstream side and an upstream base side, said upstream and downstream base sides being substantially flat and parallel surfaces which are spaced from one another, and plate means

disposed in said space between said base sides, said plate means having one plate side spaced from said upstream base side and another plate side spaced from said downstream side.

4,891,990

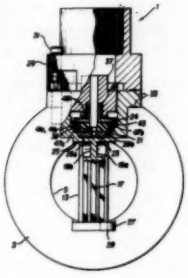
VORTEX FLOWMETER TRANSDUCER

Mohamed Khalifa, Peachtree City, Ga., and John Manwell, Liverpool, United Kingdom, assignors to Schlumberger Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 129,123, Dec. 4, 1987, Pat. No. 4,864,868. This application Nov. 15, 1988, Ser. No. 271,490

Int. Cl.[4] G01F *1/38*

U.S. Cl. 73—861.24 **15 Claims**



1. A vortex flowmeter comprising:

a conduit for confining a fluid flowing therein;

a vortex shedding body having a portion placed within the conduit for generating vortices from fluid flowing past the body;

the body including a recessed portion having a surface which is subject to impact from the vortices generated by fluid flowing past the body;

the body further including a cavity portion located at one end thereof and outside the conduit, the cavity having a wall subject to alternate flexing caused by forces transmitted from the surface of the recessed portion of the body to the cavity portion of the body due to the impact of the vortices on the surface of the recessed portion of the body; and

means for sensing the flexing of the wall of the cavity including;

(a) at least one light source;

(b) light detection means;

(c) reflective means disposed on the wall portion of the cavity and;

(d) optical fiber means for transmitting light from the light source to the reflective means and to the light detection means;

the flexing of the wall of the cavity causing an output from the sensing means which represents the difference between the amplitude of the alternate flexing of the wall caused by impact of the vortices generated by the body.

4,891,991

CORIOLIS-TYPE MASS FLOWMETER

Wade M. Mattar, Wrentham; Duane T. Thompson, Franklin; Joseph P. DeCarlo, Wrentham, all of Mass.; Yousif Hussain, Walton on Thames, United Kingdom, and Gordon W. Chitty, Norfolk, Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Oct. 28, 1986, Ser. No. 923,847

Int. Cl.[4] G01F *1/84*

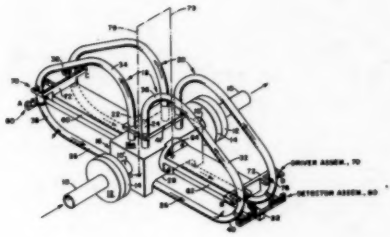
U.S. Cl. 73—861.38 **38 Claims**

1. A dual drive Coriolis-type mass flowmeter, comprising

a support,

a continuous loop of conduit solidly mounted at its inlet and outlet ends to the support,

a pair of drive means acting on said loop at different respective points along the loop for oscillating said loop about an oscillation axis, the portion of said loop between said pair of drive means being a substantially straight section,



a coaxial inlet and outlet, said straight section being perpendicular to the inlet/outlet axis, and

means for measuring the magnitude of Coriolis forces, arising as a result of mass flow in the portion of said conduit undergoing oscillatory motion.

4,891,992

TORQUE DETECTING APPARATUS

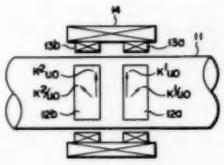
Tadahiko Kobayashi; Masashi Sahashi, and Yoichi Tokai, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1989, Ser. No. 301,121

Claims priority, application Japan, Jan. 26, 1988, 63-15256

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 **16 Claims**



1. A torque detecting apparatus comprising:

a magnetic metal thin strip fixed on the circumferential surface of a torque transmitting shaft as an object of torque detection;

an induced magnetic anisotropy given in advance to said magnetic metal thin strip, said induced magnetic anisotropy appearing in a direction of a principal stress produced in said magnetic metal thin strip when a torque is imposed on said torque transmitting shaft;

a shape magnetic anisotropy of said magnetic metal thin strip caused by a shape of said magnetic metal thin strip, said shape magnetic anisotropy appearing in a direction forming an angle of 45° with the direction of the principal stress; and

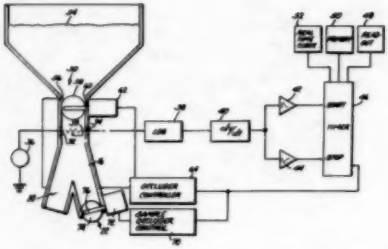
detection means for detecting a change in magnetic anisotropy produced in the magnetic metal thin strip by a torque imposed on the torque transmitting shaft.

4,891,993

APPARATUS AND METHOD FOR MEASUREMENT OF URINE VOID VOLUMES

Kent R. Barker, Eagan, Minn., assignor to Prevention Sciences Incorporated, Eagan, Minn.

Filed Sep. 30, 1988, Ser. No. 252,456
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—863.52 **11 Claims**



7. An apparatus for measuring urine volume comprising:

a pair of electrically isolated electrodes;

means for collecting urine and conveying streams of urine past the isolated electrodes at a substantially constant rate of flow; and

means for generating opposite polarity timing pulses associated, respectively, with increases and decreases in resistance between the electrodes associated with the beginning and the cessation of urine flow, including a source of alternating electrical potential connected to one of the isolated electrical terminals, a logarithmic signal generator coupled to a second one of the isolated electrical terminals, and a differentiating circuit coupled to receive signals from the logarithmic signal generator for generating the opposite polarity timing pulses indicating onset and cessation of urine flow through the outflow conduit; and

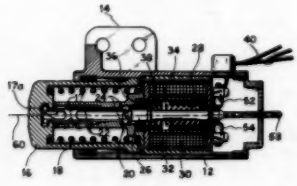
a clock responsive to the timing pulses for determining the volume of the urine flow by timing their duration.

4,891,994

LINEAR ELECTROMECHANICAL ACTUATOR

Valentin G. Barba, Princeton Junction, N.J., assignor to Plessey Incorporated, White Plains, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,109
Int. Cl.[4] G05G *17/00*
U.S. Cl. 74—2 **18 Claims**



1. A linear elctromechanical actuator comprising:

a housing a first longitudinal axis;

a solenoid coil disposed in said housing and having a second longitudinal axis;

an armature electromagnetically coupled to said solenoid coil and mounted for longitudinal motion in a first direction along said second longitudinal axis in response to energization of said solenoid coil;

first means for resiliently urging said armature to move in a second direction along said second longitudinal axis, said second direction being opposite to said first direction, said solenoid coil being strong enough when energized to overcome the effect of said first means on said armature and cause said armature to move in said first direction;

an actuator member mounted for longitudinal reciprocation along said first longitudinal axis;

second means for resiliently urging said actuator member to move from a first position to a second position along said first longitudinal axis;

means for releasably retaining said actuator member at said first position;

means for operatively connecting said armature to said means for releasably retaining so that after a predetermined amount of motion of said armature in said first direction, said armature causes said means for releasably retaining to release said actuator member, thereby allowing said second means for resiliently urging to move said actuator member from said first position to said second position; and

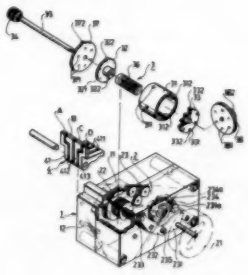
means responsive to said means for releasably retaining said actuator member at said first position for producing an output indication if and only if said means for releasably retaining is fully operational to retain said actuator member at said first position.

4,891,995

TRIGGER CONTROL MEANS FOR MOVEABLE TOYS

Weng-Pin Lin, No. 30, Chien-Yung St., Taichung City, Taiwan

Filed Apr. 14, 1988, Ser. No. 181,491
Claims priority, application Japan, Aug. 20, 1987, 62-207339
Int. Cl.[4] G05G *17/00*; A63H *11/10*
U.S. Cl. 74—3.52 **8 Claims**



1. A toy comprising:

acting means for generating an acting force, said acting means having a member for triggering the acting force;

rotating means adapted to be driven by a rotating force for carrying out a primary action;

at least one rocking arm having a first end and a second end;

a rotatable can drum with an exterior cam surface;

tongues disposed on said cam surface, so that as said cam drum is rotated causing a tongue to urge against said second end of said rocking arm, said first end is caused to rock and thereby actuate said acting means; and

a gear train for reducing and transmitting the rotating force to said rotating means.

4,891,996

ENGINE STARTER HAVING PLANET REDUCTION GEAR MECHANISM

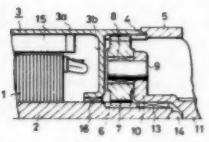
Shuzoo Isozumi, and Tetsuo Yagi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,710

Claims priority, application Japan, Dec. 25, 1986, 61-201596[U]; Dec. 25, 1986, 61-201597[U]; Jan. 7, 1987, 62-1321[U]

Int. Cl.[4] F02N *11/00*

U.S. Cl. 74—6 **4 Claims**



1. An engine starter for an internal combustion engine, comprising: a planet reduction gear mechanism including a solar gear (**6**), a plurality of planet gears (**7**), and an internal gear member (**4**), and a d.c. motor including a cylindrical yoke (**3**) having an axial extension formed integrally and in one piece therewith, said extension defining a housing surrounding the planet reduction gear mechanism and having a toothed inner circumferential surface defining the internal gear member, an armature (**1**) fixedly secured to a rotary shaft (**2**) of said motor defining said solar gear at one end thereof, and magnet means (**15**) disposed between said armature and said yoke, said axial yoke extension being non-rotatably fitted to a mounting bracket (**5**), said internal gear member meshing with said planet gears, which in turn mesh with said solar gear, said planet gears being supported by a flange portion (**10**) of an output shaft (**11**), and flange means (*3b;* **22**) disposed between said yoke and said axial extension and extending radially inwardly therefrom for providing a partition therebetween, said flange means being formed with a center hole for supporting a bearing (**16**), and said rotary shaft of said motor being rotatably supported by said bearing, wherein said flange means is formed integrally and in one piece with an inner surface of said cylindrical yoke, wherein a root diameter circle of the toothed inner circumferential surface of the axial extension is substantially co-cylindrical with an inner circumferential surface of said yoke.

4,891,997

DYNAMICALLY TUNED GYRO

Sokichi Hayashi, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

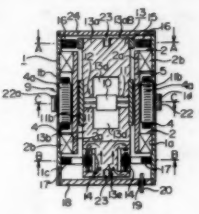
Filed Jul. 27, 1988, Ser. No. 224,900

Claims priority, application Japan, Oct. 8, 1987, 62-252498; Oct. 8, 1987, 62-153327; Oct. 14, 1987, 62-156136

Int. Cl.[4] G01C *19/08, 19/28, 19/30*

U.S. Cl. 74—5.46 **6 Claims**

1. A dynamically tuned gyro comprising in combination a cylindrical hysteresis ring mounted for rotation about its longitudinal axis within a cylindrical casing having a radially inner wall, said ring being joined to said casing wall by a pair of axially spaced apart bearings concentric with said ring, a stator for cooperating with said hysteresis ring to provide a spin motor, said stator being mounted within said casing axially between said bearings and radially between said hysteresis ring and said casing operatively spaced from said ring, a cylindrical gyro rotor having first and second ends and mounted through a hinge unit within said hysteresis ring with a predetermined radial gap therebetween, said gap being selected to determine the permitted range of tilting of said gyro rotor, a sensor ring mounted on said gyro rotor adjacent said first end of said rotor, a pair of axially spaced apart ring magnets mounted on said gyro rotor adjacent said second end of said rotor, a sensor coil mounted on said wall of said casing confronting in operative



relation said sensor ring, and a torquer coil mounted on said wall of said casing confronting in operative fashion said ring magnets.

4,891,998

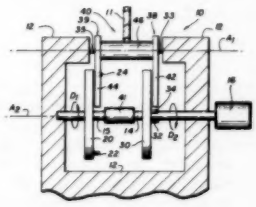
MOTION CONVERSION APPARATUS

Thomas W. Tourville, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 20, 1988, Ser. No. 209,246

Int. Cl.[4] F16H *21/40;* **G02B** *26/10*

U.S. Cl. 74—48 **2 Claims**



1. A motion conversion apparatus for converting input rotational motion into output oscillatory motion comprising:

link means disposed to pivot about a pivot point and coupled to a first member for inducing oscillation of said first member about a first axis thereby providing said output oscillatory motion, said link means including first and second slotted coupling arms attached to opposite ends of a first shaft;

flywheel means adapted to rotate about a second axis for causing said link means to pivot about said pivot point said flywheel means including:

first and second flywheels rotating in opposite directions about said second axis;

drive roller means mounted on said first and second flywheels for engaging said link means;

means for coupling said first and second flywheels; and

shaft means adapted to rotate about said second axis and operatively coupled to said flywheel means for providing said input rotational motion.

4,891,999

SHIFT CONTROL SYSTEM FOR A HYDROMECHANICAL TRACTOR TRANSMISSION

Leonard A. Scott, Bellwood, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 19, 1988, Ser. No. 246,426

Int. Cl.[4] F16H *5/06*

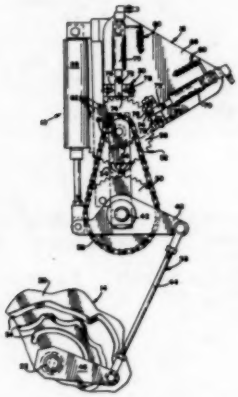
U.S. Cl. 74—337.5 **5 Claims**

1. A shift control system for a hydromechanical tractor

transmission which is shiftable between a plurality of different gear ratios, said shift control system comprising:

a cam mounted on said transmission for rotation about a pivot and between a series of distinct angular positions, said cam defining a cam profile which controls in which gear ratio said transmission is operated as a function of the angular disposition of said cam; and

an electronically controlled cam shifter assembly which is responsive to electric shift signals derived from a control unit, said cam shifter assembly comprising actuating



means responsive to said electric shift signals and including a driver and connecting means between the driver and said cam for rotatably shifting the cam and imparting angular movement thereto, a profiled member driven in timed relation to said cam and having a series of spaced radial projections thereon, the spacing between said projections being equal to a distance the cam must be rotated to effect a change in gear ratios, and stop means operated in response to said electric shift signals and in timed concert with said actuating means for limiting angular movement of said cam in incremental steps.

4,892,000

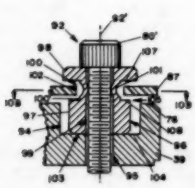
LUBRICANT RESTRICTING DEVICE

Richard J. Renk; George E. Boller, and Richard M. Ebert, all of Winona, Minn., assignors to Carol A. MacKay and Helen L. Kurtz, both of Winona, Minn.

Continuation-in-part of Ser. No. 794,769, Nov. 4, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 85,241

Int. Cl.[4] F16J *15/36*

U.S. Cl. 74—467 **4 Claims**



1. A device for use with a rotatable shaft having a gear on an end of said shaft wherein said shaft projects axially outwardly of a bearing mounting assembly having a mounting plate with a shaft bore therein through which said shaft projects, and wherein said gear on said shaft is spaced axially from said bearing mounting assembly comprising,

a base for nesting against said mounting plate between said gear and said mounting plate,

said base having an opening therein through which said shaft may project and having at least one mounting hole therein,

means carried by said base for reducing lubricant flow between said gear and said bearing mounting assembly, and

securing means for attaching said base to said mounting plate,

said securing means extending through said mounting hole including integrally connected top shoulder and bottom shoulders spaced apart from one another on opposite sides of said hole and defining a recessed groove with a connecting bottom wall therebetween extending through said mounting hole of said base, said recessed groove defined between said shoulders being of a width greater than the thickness of said base adjacent said securing means with said bottom shoulder projecting slightly above said mounting plate to space said base above said mounting plate to allow said base to move without substantial binding against said shoulders and against said mounting plate so as to accommodate differences in thermal expansion and contraction between said base and said mounting plate.

4,892,001

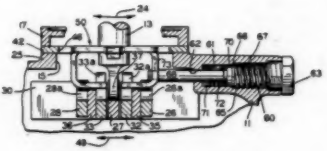
INTERLOCK ASSEMBLY FOR A VEHICLE TRANSMISSION

Richard S. Meyers, Jonesboro, Ark., and Charles R. Jones, Ottawa Lake, Mich., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 6, 1988, Ser. No. 240,858

Int. Cl.[4] G05G *5/10, 9/14*

U.S. Cl. 74—477 **24 Claims**



1. In a vehicle transmission including a housing and a shift lever extending into the housing, a means for urging the shift lever toward a predetermined position within the housing comprising:

an aperture formed through the housing, said aperture including a first diameter portion and a second diameter portion, a shoulder being defined between said first and second diameter portions;

a washer disposed in said first diameter portion of said aperture;

first spring means for urging said washer against said shoulder;

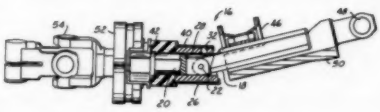
pin means having a first end thereof disposed in said second diameter portion of said aperture and a second end thereof being connected with the shift lever for movement therewith; and

second spring means for urging said first end of said pin means against said washer, the shift lever being positioned in the predetermined position when said washer engages said shoulder and said first end of said pin means engages said washer.

4,892,002
ARTICULATED STEERING DRIVESHAFT

John L. Groat, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1988, Ser. No. 228,206
Int. Cl.[4] B62D 1/16
U.S. Cl. 74—492 13 Claims



1. An articulated steering driveshaft for an automotive vehicle, comprising:

first and second shaft segments coupled by means of a selectively foldable joint, with said joint comprising:

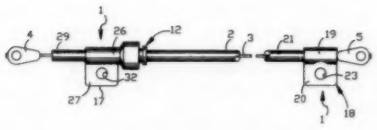
a hinge for joining said shaft segments for rotation about an axis perpendicular to the axes of said shafts; and

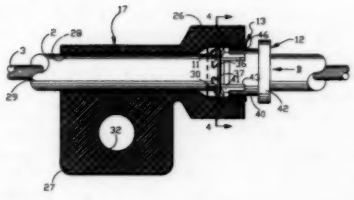
a sleeve slidably mounted upon said shaft segments and said hinge, with said sleeve being movable from a first position in which said sleeve extends axially over substantially the entirety of said hinge to a second position in which said sleeve extends over a lesser portion of said hinge, with said positions being further characterized such that while occupying said first position said sleeve is adapted to transmit steering torque from one of said shaft segments to the other of said segments while maintaining said segments in coaxial alignment, whereas while occupying said second position said sleeve allows said shaft segments to fold with respect to each other about the axis of said hinge.

4,892,003
ASSEMBLY FOR THE SELF-ADJUSTMENT OF A CABLE CASING

James T. Quinlan, Massillon, Ohio, assignor to Flex Technologies, Inc., Midvale, Ohio

Filed Apr. 27, 1988, Ser. No. 186,570
Int. Cl.[4] F16C 1/14
U.S. Cl. 74—501.5 R 16 Claims





1. An assembly for the self-adjustment of a casing of the type having a cable slideably mounted therein, wherein said cable extends between a manually operated lever of a vehicle temperature control module and a door movably mounted on a forward bulkhead of said vehicle, said assembly including:

(a) first and second mounting means for attaching the casing at spaced locations generally adjacent the control module lever and door, respectively;

(b) tang means mounted in the first mounting means for encircling and gripping the casing, said tang means being a generally flat ring having a plurality of circumferentially spaced, generally radially inwardly extending tangs permitting passage of said casing therethrough in a single direction;

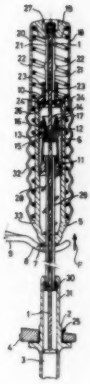
(c) release means mounted in the first mounting means and engageable with the tang means for manually releasing said tang means from the casing; and

(d) retainer means mounted in the first mounting means for retaining the tang means and release means in said first mounting means adjacent a movable end of the casing, so that upon manual adjustment of the lever in a first direction said movable casing end moves through the tang means in the single direction to remove slack from the casing and to retain the casing is an adjusted position by the tang means.

4,892,004
AUTOMATIC LENGTH ADJUSTER FOR CONTROL CABLES

Antonio T. Segura, and Victorino S. Sallant, both of Barcelona, Spain, assignors to Pujol Y Tarrago S.A., Barcelona, Spain

Filed Jun. 22, 1988, Ser. No. 209,858
Claims priority, application Spain, Jul. 2, 1987, 8701942
Int. Cl.[4] F16C 1/10
U.S. Cl. 74—501.5 R 10 Claims



6. A length adjuster for automatically adjusting an effective length of a control cable for controlling a member in accordance with a change in a position of the member, said length adjuster comprising:

a hollow cylindrical body;

a tubular body telescopically mounted with respect to said hollow cylindrical body, said tubular body being radially outside said hollow cylindrical body;

means for anchoring the control cable to said tubular body, the control cable extending axially through said hollow cylindrical body and said tubular body;

a compensation spring interposed between said hollow cylindrical body and said tubular body; and

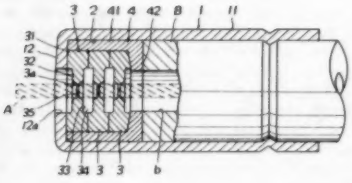
means displaceable within said hollow cylindrical body for connecting the control cable to said hollow cylindrical body at different relative longitudinal positions in accordance with different positions of the member to transmit a control force from the cable to the member in a respective position of the member.

4,892,005

END CAP FOR AN OUTER CABLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 29, 1988, Ser. No. 187,927
Claims priority, application Japan, May 2, 1987, 62-67325[U]
Int. Cl.[4] F16C 1/10; F16N 7/16
U.S. Cl. 74—502.4 **4 Claims**



1. An end cap adapted to be used on an outer cable guiding a control wire of a bicycle, said end cap comprising:

a tubular cap body provided with a bottom portion having an insertion bore adapted to receive the control wire so as to enable the outer cable to be inserted into said cap body;

a holding means adapted to hold an end face of the outer cable at a given position when the outer cable is fitted into said cap body to form a chamber having an open space between the end face of the outer cable and an inner surface of said bottom portion; and

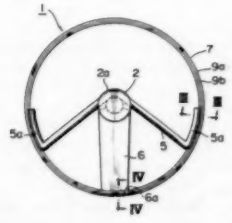
a plurality of sealing members disposed in said chamber and having a sealing portion adapted to surround and seal an outer periphery of the control wire, wherein each of said sealing members is provided with an annular portion and a lip portion extending radially inwardly from an inner periphery of said annular portion and having a center portion adapted to have the control wire inserted therethrough.

4,892,006

STEERING WHEEL RIM CORE AND ELONGATED BLANK THEREFOR

Tetsuji Endo, Fujinomiya, and Kazuyoshi Nishijima, Shizuoka, both of Japan, assignors to Nihon Plast Co., Ltd., Fuji, Japan

Filed Dec. 8, 1987, Ser. No. 130,720
Claims priority, application Japan, Dec. 12, 1986, 61-296127; Dec. 12, 1986, 61-296128
Int. Cl.[4] B62D 1/04
U.S. Cl. 74—552 **3 Claims**



1. An annular rim core for a steering wheel having at least one spoke through which said annular rim core is connected to a central hub, said annular rim core comprising:

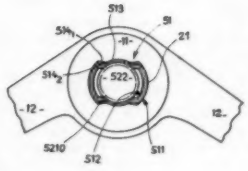
an annular rim structure having a pair of axially spaced side walls and a radially outer wall having a radially outwardly directed outer surface and interconnecting said side walls, such that said rim structure is open in the radially inward direction, wherein said side walls and said radially outer wall are shaped such that a first annular recess having first thickness dimension is formed between said side walls for receiving therein a spoke core of said first thickness dimension and a second annular recess is formed in one of a bottom of said first annular recess and said radially outwardly directed outer surface, said second annular recesses having an axially measured second thickness dimension smaller than said first thickness dimension.

4,892,007

DEVICE FOR COUPLING A WHEEL TO ITS SHAFT AND THE APPLICATION OF THE DEVICE IN THE KEYING OF AN AUTOMOBILE STEERING WHEEL

Bernard Haldric, and Sylvie Baudon nee Chardon, both of Vendome, France, assignors to NACAM, Vendome, France

Filed May 13, 1988, Ser. No. 193,684
Claims priority, application France, May 19, 1987, 87 06971
Int. Cl.[4] B62D 1/18; F16D 1/00
U.S. Cl. 74—552 **11 Claims**



1. Coupling structure securing a wheel to a shaft and which structure allows the wheel to be axially and angularly positioned relative to the shaft prior to the securement thereof, said structure comprising:

a hub connected to said wheel and disposed on said shaft at an end portion of said shaft,

said hub and said end portion of said shaft having complementary arcuate peripheral bearing surfaces engaging one another with substantially no clearance therebetween and terminating at end portions thereof,

the bearing surface of one of said hub and said end portion of said shaft being an outer peripheral surface of said one of said hub and said end portion of said shaft, and said one of said hub and said end portion of said shaft having a respective projection extending radially from the outer peripheral bearing surface thereof and defined between end portions of the outer peripheral bearing surface,

the bearing surface of the other of said hub and said end portion of said shaft being an internal peripheral surface of said other of said hub and said end portion of said shaft, and the other of said hub and said end portion of said shaft having a respective cavity defined therein between each pair of end portions of and contiguous to said internal peripheral bearing surface, each respective said cavity receiving a respective said projection therein,

each said cavity and the projection received therein being defined at least in part by radially extending abutment surfaces of said hub and said end portion of said shaft, each said radially extending abutment surface of said end portion of said shaft confronting and spaced from a said radially extending abutment surface of said hub wherein said abutment surfaces limit the extent to which the wheel can be angularly positioned relative to the shaft; and

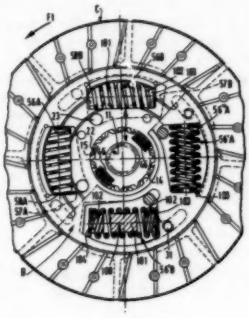
radial expansion means located within the end portion of said shaft and exerting a radially outward force that acts on said bearing surfaces to frictionally bind said bearing surfaces and secure the wheel to said shaft.

4,892,008

TORSION DAMPING DEVICE

Jacky Naudin, Ermont, and Jacques Alas, Eaubonne, both of France, assignors to Valeo, Paris, France

Filed Apr. 13, 1988, Ser. No. 181,039
Claims priority, application France, Apr. 14, 1987, 87 05294
Int. Cl.[4] F16F *15/10*
U.S. Cl. 74—574 4 Claims



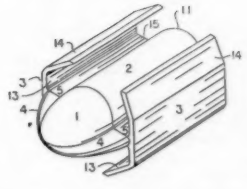
1. A torsion damping device, especially for automobiles, of the kind comprising at least two coaxial parts mounted to rotate relative to one another within defined limits of angular displacement against elastic units extending in the circumferential direction, each elastic unit having an interior, each elastic unit being disposed partly, on the one hand, in an opening of one of said parts and, on the other hand, in an opening of the other of said parts, wherein inside at least one elastic unit a stiffer elastic means is housed, comprising, in the central zone of said unit, a block of relatively rigid plastic material disposed with a predetermined clearance relative to two elastic pads which said elastic unit presents at each of its circumferential ends and wherein the elastic pads are supported by small spring seats in the shape of small plates interposed between each circumferential end of said elastic unit and a housing of one of the said parts.

4,892,009

BULLET BICYCLE PEDAL

Peter O. Gibson, 1445 Casino Cir., Silver Spring, Md. 20906

Filed Jun. 20, 1988, Ser. No. 209,006
Int. Cl.[4] G05G *1/14;* A43B *5/00*
U.S. Cl. 74—594.6 3 Claims



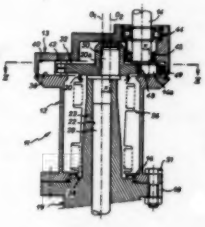
1. A bicycle pedal enabling lateral engagement of a cleat;
said pedal comprising a spindle with a longitudinal axis, a body, two lateral plates, two side flanges and a lead;
said pedal having two opposed substantially identical bilaterally symmetric tracks substantially parallel said longitudinal axis,
said body having two exterior convex surfaces, a free end, a fixed end and two sides,
each said lateral plate extended along said body in opposition to each other and having two opposed substantially parallel surfaces,
each said flange disposed substantially perpendicular either said lateral plate in aposition to each other and further extended symmetrically over a portion of both said opposed surfaces of one said lateral plate,
each said track bounded by a bilaterally symmetric set of longitudinally contiguous surfaces comprising one said body central convex surface with two substantially coplanar laterally adjacent surfaces and two laterally distal side surfaces in aposition defining the width of said track,
each said laterally distal side surface further projecting inwardly in juxtaposition to said central convex surface,
said lead attached said body free end and possessing two opposed bilaterally symmetric exterior surfaces,
each said lead exterior surface being flush said central convex surface and both substantially co-planar laterally adjacent surfaces of one said track,
said lead further tapering away from said pedal tracks to an apex coincident said longitudinal axis.

4,892,010

SEALED TRANSMISSION DEVICE USING METAL BELLOWS, SUITABLE FOR QUARTERTURN VALVES

Daniel Pottier; Rémy Leclaire, and Paul Vulliez, all of Pont-Audemer, France, assignors to 501 Normetex, Pont-Audemer, France

Filed Jul. 1, 1988, Ser. No. 214,610
Claims priority, application France, Jul. 2, 1987, 87 09402
Int. Cl.[4] F16C *3/04;* F16J *15/50*
U.S. Cl. 74—595 10 Claims



1. A sealed rotary transmission device comprising a control shaft, a receiver shaft parallel to and, spaced apart from said control shaft, a bellows having an upper end and a lower end surrounding said receiver shaft, a casing having an upper end and a lower end surrounding said bellows, the lower end of said bellows being fixed in a sealed way to the lower end of said casing, a transfer member having a radially outer most part is disposed in the upper end of said casing and constrained to move in said casing in a direction parallel to a plane which is perpendicular to said receiver shaft, the upper end of said bellows is fixed in a sealed way to said transfer member, a crank is attached to said control shaft and a crank is attached to said receiver shaft, the crank of the control shaft and the crank of the receiver shaft are eccentric to the axis of their respective control shaft and receiver shaft by the same distance, the crank of the control shaft and the crank of the receiver shaft are each coupled to said transfer member and are spaced apart by a distance which is equal to the distance between the control shaft and the receiver shaft, to enable circular translation of said transfer member, and the upper portion of said casing comprises two annular guide surfaces between which the radially outermost part of said transfer member is inserted and guided in its movement.

4,892,011
PLANETARY GEAR MECHANISM ON AN AUTOMATIC TRANSMISSION

Masaaki Nishida, Anjo, and Youichi Hayakawa, Toyoake, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

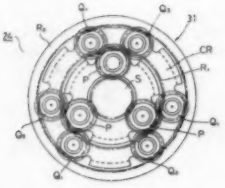
PCT No. PCT/JP87/00483, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00301, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 8, 1987, Ser. No. 181,148

Claims priority, application Japan, Jul. 8, 1986, 61-161263

Int. Cl.[4] F16H *57/10, 1/28*

U.S. Cl. 74—761 **13 Claims**



1. A planetary gear set comprising:

a dual planetary gear unit including a sun gear, a ring gear, a first planetary pinion means operatively disposed between said sun gear and said ring gear and comprising at least one first pinion for transmitting torque between said sun gear and said ring gear, a second planetary pinion means operatively disposed between said sun gear and said ring gear and comprising a respective pair of circumferentially spaced second pinions associated with each said first pinion for also transmitting torque between said sun gear and said ring gear, and a carrier to which said second pinions are rotatably mounted,

said carrier rotatably supported in said gear set relative to said sun gear,

each said first pinion meshing with only the respective pair of second pinions associated therewith and one of said sun gear and said ring gear in said dual planetary gear unit, and

each said respective pair of second pinions meshing with only the first pinion associated therewith and the other of said sun gear and said ring gear in said dual planetary gear unit.

4,892,012
AUTOMATIC TRANSMISSIONS OF VEHICLE

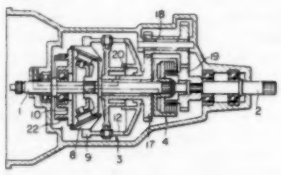
Tadashi Kashihara, Kyoto, Japan, assignor to Shimpo Kogyo Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 96,751, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 697,632, Feb. 4, 1985, abandoned. This application Jan. 30, 1989, Ser. No. 303,081

Claims priority, application Japan, Feb. 2, 1984, 59-17480; Oct. 24, 1984, 59-223779

Int. Cl.[4] F16H *15/50, 57/10*

U.S. Cl. 74—772 **3 Claims**



1. Automatic transmission of vehicle including a stepless speed change gear equipped with a plurality of planet-rollers having a conical surface frictionally engaging with a axially movable ring member, a surface of concave cross-section frictionally engaging with a sun-member on an input shaft of the transmission and a flat surface frictionally engaging with a disc-member normally constrained against rotation, the rotation of the axially movable ring-member being first transmitted to an output member of the stepless speed change gear, characterized in that:

a. speed increasing gear means provided between the output member of the stepless speed change gear and in the output shaft of the transmission, an upper limit of the speed ratio between the input shaft and the output shaft of the transmission being increased to 1:1 by the provision of this speed increasing gear means, and in that;

b. first means for finding a state wherein the above speed ratio increased to 1:1, and second means for finding a state wherein the above speed ratio should be decreased from 1:1 are provided, and in that;

c. clutch-means provided between the input shaft of the transmission and the output member of the stepless speed change gear, this clutch means being operated to take an engaged state by a signal from the above first means and being operated to take a disengaged state by a signal from the above second means; and in that:

d. releasing means which operates simultaneously with said clutch-means to release the stepless speed change gear; and

e. means for determining the position of said ring-member corresponding to a torque acting on said output shaft, which is composed of a cam device on a member provided between said ring-member and said output shaft and means for applying a force in a speed increasing direction to said ring-member.

4,892,013
VARIABLE SPEED GEARING IN ROTARY ELECTRIC TOOL

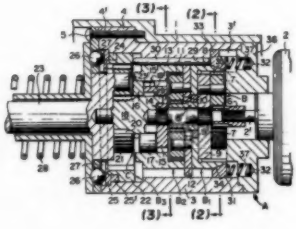
Atsushi Satoh, Saitama, Japan, assignor to Olympic Co. Ltd., Iruma, Japan

Filed Jun. 29, 1988, Ser. No. 213,156

Claims priority, application Japan, Jul. 30, 1987, 62-190587

Int. Cl.[4] F16H *3/74*

U.S. Cl. 74—785 **20 Claims**



11. A variable speed gearing arrangement comprising:

(a) a gear case having a longitudinal axis;

(b) an axially movable brake disk;

(c) a first planetary gear mechanism to be operably connected to a driving shaft, said first planetary gear mechanism including an internal gear having a surface which is engageable with said axially movable brake disk to maintain said internal gear against rotation during such engagement;

(d) means for biasing said brake disk against said internal gear of said first planetary gear mechanism for engagement therewith;

(e) a final planetary gear mechanism to be operably connected to an output shaft, said final planetary gear mechanism including an axially movable internal gear having an

outer periphery, said movable internal gear having projections located on said outer periphery;

(f) a torque-setting cam for engagement with said internal gear of said final planetary gear mechanism by means of said projections of said internal gear of said final planetary gear mechanism to maintain said movable internal gear against axial movement; and

(g) means for moving said brake disk in opposition to said means for biasing said brake disk, in response to movement of said movable internal gear of said final planetary gear mechanism, to separate said brake disk from said surface of said internal gear of said first planetary gear mechanism.

4,892,014

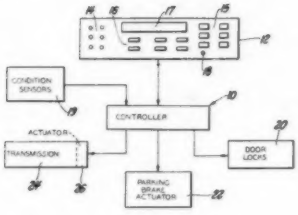
ELECTRONIC CONTROLLER FOR AUTOMATIC TRANSMISSIONS

Thomas H. Morell, Grand Haven, Mich., and Frederick A. Schonfeld, Albuquerque, N. Mex., assignors to Sparton Corporation, Jackson, Mich.

Filed Feb. 1, 1988, Ser. No. 150,985

Int. Cl.[4] B60K *41/06*

U.S. Cl. 74—866 **2 Claims**



1. In an automotive vehicle, an electronic transmission controller for an automatic transmission having neutral, reverse, forward and park ranges and subject to range selection by electrical signals from the controller, the controller comprising;

speed sensors for sensing vehicle speed and engine speed,

ignition sensors for sensing whether the ignition is on and whether the key is in the ignition switch,

means for controlling the transmission park range in response to preset values of sensed vehicle conditions including programmable electronic means coupled to the sensors for producing electrical signals for range selection, the electronic means being programmed to limit the transmission to park range on the basis of prescribed sensor conditions,

said vehicle being equipped with a power operated parking brake and wherein the electronic means produced a brake signal, and

actuator means responsive to the brake signal for applying the parking brake when the transmission is shifted to its park range.

4,892,015

PLIERS FOR STRIPPING THE ENDS OF CONDUCTORS

Horst Beetz, Stadtallendorf, and Kurt Battenfeld, Ebsdorfergrund, both of Fed. Rep. of Germany, assignors to Wezag GmbH, Stadtallendorf, Fed. Rep. of Germany

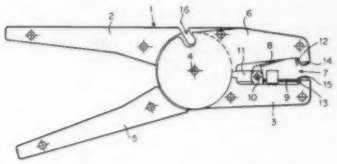
Filed Sep. 30, 1988, Ser. No. 252,376

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733358

Int. Cl.[4] H02G *1/12*

U.S. Cl. 81—9.41 **10 Claims**

1. Pliers for stripping the ends of conductors, with a pair of handles and with a pair of gripping jaws that demarcate a mouth and can be forced against the insulation on the conductor, whereby one of the gripping jaws is integrated into one of the handles and constitutes a main pliers component, on which the other handle and the other gripping jaw pivot, with a control lever that has a roller mounted on it and pivots on the moving handle against the force of a restoring spring, with a stop positioned on the moving gripping jaw and establishing the starting position, with a control surface and a limiting stop associated with the roller on the control lever, and with two stripping jaws that are accommodated inside the gripping jaws, that are subject to the force of an expansion spring, that pivot



together at the ends remote from the mouth, and that can be jointly displaced longitudinally in the insulation-stripping direction by a tensioning component that comes into action once the moving handle has traveled a prescribed distance, characterized in that the moving handle (**5**) and the moving gripping jaw (**6**) pivot around the same axis (**4**) on the main component (**1**) of the pliers, in that the stripping jaws (**8** and **9**) are articulated to the control lever (**23**) by way of the tensioning component (**11**), and in that the stop (**29**), the control surface (**30**), and the limiting stop (**31**) are accommodated in the moving gripping jaw and associated strictly with the stripping motion.

4,892,016

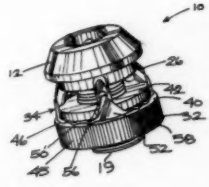
ADJUSTABLE SOCKET

J. E. C. Anderson, Moreland Hills, Ohio, assignor to Milbar Corporation, Chagrin Falls, Ohio

Continuation of Ser. No. 162,980, Mar. 2, 1988, abandoned. This application Apr. 20, 1989, Ser. No. 344,549

Int. Cl.[4] B25B *13/18*

U.S. Cl. 81—128 **11 Claims**



1. An adjustable socket comprising:

a driver rotatable a longitudinal axis, said driver having a plurality of inclined slideways extending with both radial and axial components with respect to the longitudinal axis;

a plurality of jaws respectively supported within the slideways of the driver for inward and outward movement along with concomitant axial movement with respect to the longitudinal axis;

each of said jaws having an internal driver aperture having an aperture axis transverse to said longitudinal axis;

an adjuster including a jaw operating member, a plurality of jaw clips and a connection that secures the jaws, jaw operating member and jaw clips to maintain the assembled condition of the socket and limit movement of the jaws;

said jaw operating member including a flange surface projecting outwardly with respect to the longitudinal axis, and groove structure spaced from said flange for support-

ing said jaw clips during operating engagement with walls of the driving apertures in each of said jaws;

mating helical surfaces supporting the adjuster on the driver for axial adjusting motion upon relative rotation that moves the jaws axially and concomitantly inwardly or outwardly along the slideways for size adjustment between open and closed positions;

said jaws each having a surface complemental to and in engagement with said flange surface during movement from said open to said closed positions and when the socket is in use; and,

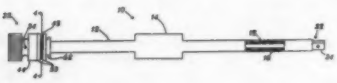
each of said jaw clips being in engagement with a wall of said groove and an associated driving aperture wall when the socket is moved from its closed to its open position.

4,892,017

AUTOMOTIVE FUEL SYSTEM ADJUSTMENT TOOL

T. W. Kennedy, 13145 Woodmont Pl., Poway, Calif. 92064, and James C. McMillen, 1498 Country Club Dr., Escondido, Calif. 92025

Filed Apr. 7, 1989, Ser. No. 334,478
Int. Cl.[4] B25B 7/02
U.S. Cl. 81—492 **13 Claims**



1. A fuel system adjustment tool, comprising:

an elongated hollow shaft;

transmittal means for transmitting a rotational motion from one end of the hollow shaft to the other end, the transmittal means being disposed within, and rotatable within, the hollow shaft;

a drive head attached to the transmittal means at one end of the hollow shaft and extending beyond that end of the hollow shaft;

a rotatable control knob attached to the transmittal means at the other end of the hollow shaft; and

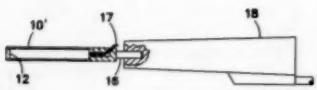
sensing means for creating in the control knob a tactile sensation of releasable engagement at preselected degrees of rotation of the drive head.

4,892,018

DEFLASHING METHOD AND APPARATUS

Beryl A. Boggs, Richmond, Va., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 3, 1985, Ser. No. 771,963
Int. Cl.[4] A47L 11/12
U.S. Cl. 83—15 **9 Claims**



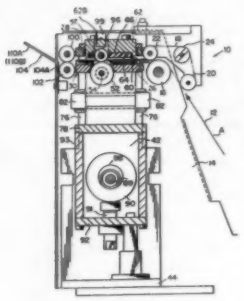
1. Apparatus for deflashing a fiber reinforced plastic article comprising a cutting edge, means for heating the cutting edge to a temperature of at least 800° F. (427° C.), and means for vibrating said cutting edge.

4,892,019

SHEET PUNCHING CUTTER

Mikio Kogane; Mizuho Nishimura, both of Kanagawa, and Tsutomu Kimura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1987, Ser. No. 85,600
Claims priority, application Japan, Aug. 28, 1986, 61-202551; Aug. 28, 1986, 61-202552; Aug. 29, 1986, 61-203476; Aug. 29, 1986, 61-203477
Int. Cl.[4] B26D 7/18, 9/00
U.S. Cl. 83—105 **19 Claims**



1. A sheet punching cutter for punching a sheet of material comprising:

a fixed block;

a moving punching blade having an aperture defined therein and being moveable towards and away from said fixed block, said sheet being disposed between said fixed block and said punching blade such that movement thereof toward said fixed block causes a portion of said sheet to be punched therefrom, the unpunched portion being a punched-remainder portion;

a transporting roller disposed inside said moving punching blade for transporting a punched-out portion of said sheet punched by said moving punching blade, said transporting roller being driven so as to convey said punched-out portion at a first speed; and

transporting means for moving said sheet to the punching position at which said sheet is punched and moving said sheet away from said punching position, said transporting means conveying said sheet at a second speed, wherein said second speed is different from said first speed to facilitate the separation of said punched out portion from said sheet.

4,892,020

WORKPIECE SUPPORT SYSTEM FOR CUTTING MACHINE

Vincent T. Kozyrski, Plainville, and Alan R. Peters, Milford, both of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Filed Jul. 8, 1988, Ser. No. 216,899
Int. Cl.[4] B26D 7/02
U.S. Cl. 83—463 **20 Claims**

1. A wall-mounted support system for a sheet-cutting machine, comprising:

a frame having backing structure providing contact surfaces disposed in a generally vertical plane with said system in its normal, wall-mounted orientation;

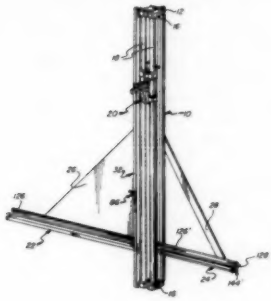
an elongated clamping unit disposed on said frame forwardly of said generally vertical plane with its longitudinal axis vertically oriented, said clamping unit comprising:

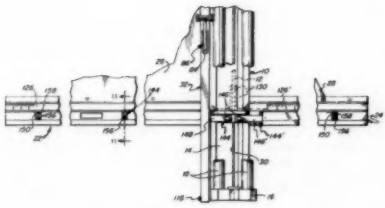
(a) an elongated, rectilinear housing member of generally U-shaped cross-section, as taken in planes transverse to its longitudinal axis, comprised of a top wall and two

spaced, parallel, coextensive sidewalls extending along the length thereof;

(b) an elongated, rectilinear clamp member assembled with said housing member and having a portion, extending along its entire length, that is of generally U-shaped cross-section, as taken in said transverse planes, said portion being comprised of a bottom wall and two spaced, parallel, coextensive sidewalls extending along the length thereof, the spacing of said clamp member sidewalls being less than that of said housing member sidewalls, and said clamp member sidewalls being received between said housing member sidewalls in edgewise confronting relationship, said clamp member having a clamping contact surface outwardly disposed on said bottom wall;

(c) a plurality of rigid pivot arms disposed in the space between said sidewalls of said clamp member at spaced locations along the length of said unit, each of said arms being pivotably attached to said housing member and said clamp member to permit parallel movement of said





clamp member between a retracted position, substantially within said housing member, and positions extended therefrom;

(d) a like plurality of guide pins extending transversely between said sidewalls of said clamp member and inserted through said pivot arms for pivotable attachment thereof, each of said pins having a shaft element and a head element on at least one end thereof, said head elements having low-friction outer surfaces thereon, and at least one of said head elements being interposed between the adjacent sidewalls of said clamp and housing members on each side of said unit;

(e) a handle member pivotably mounted on said housing member and having an inner end portion therewithin and an outer end portion accessible for manual operation; and

(f) a rigid link member effectively interconnecting said handle member to said clamp member, so as to enable said handle member to effect movement of said clamp member between said retracted and extended positions thereof; and

an elongated rack unit mounted on said frame forwardly of said vertical plane with its longitudinal axis horizontally oriented and parallel to said plane, said rack unit comprising:

(g) an elongated channel member attached to said frame and comprised of spaced, upstanding forward and rearward walls defining an upwardly opening channel therebetween, said rearward wall having at least one circular opening therein and said forward wall having an upper edge and a window therethrough below said upper edge and in general alignment with said opening of said rearward wall;

(h) an elongated leveling bar pivotably attached at one end, operatively to said frame, and contained within said channel of said channel member, said bar having a flat upper surface at a level below said upper edge of said forward wall and an upper marginal edge defining said forward wall window, and having at least one aperture therethrough spaced from said one end of said bar and in general alignment with said window and opening of said forward and rearward walls, respectively; and

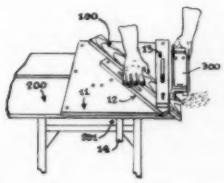
(i) an eccentric mounting fixture, including a first part rotatably seated in said circular opening of said rearward wall for rotation about an axis through the center of said opening, and a second part having opposite ends and a shaft therebetween extending through said aperture of said leveling bar on an axis parallel to said axis of rotation, said second part being engaged at one end with an inner end portion of said first part at a point offset from the axis of rotation thereof, and having means at its other end for cooperating with said first part to clamp said bar against said rearward wall; whereby rotation of said first part will raise and lower said shaft of said second part to pivot said bar, and whereby said bar can be clamped in selected positions against said rearward wall by coaction of said first and second parts.

4,892,021

VARIABLE ANGLE SAW GUIDE APPARATUS

Jeffrey A. Sanderson, 5245 Bluestem Dr., Colorado Springs, Colo. 80917

Filed Jan. 12, 1989, Ser. No. 296,266
Int. Cl.[4] G27B *27/06*
U.S. Cl. 83—468 **1 Claim**



1. A variable angle saw guide apparatus to assist an individual in cutting a piece of lumber at a precise angle using a saw wherein the apparatus consists of:

an angle plate unit comprising a generally rectangular relatively thin flat plate member having a plurality of mounting apertures disposed around the periphery of the plate member, and a plurality of angle defining apertures, including a plurality of aligned angle defining apertures and at least one additional angle defining aperture offset from said plurality of aligned angle defining apertures,

an angle guide unit comprising a first elongated generally rectangular arm member having: a pair of mounting apertures disposed proximate the ends of the arm member; and, an elongated slot formed intermediate the ends of the

arm member; wherein, the angle guide member is disposed in contact with the angle plate unit and a piece of lumber;

a hold down clamp unit operatively attached to said angle guide unit and said angle plate unit; wherein the hold down clamp unit comprises a second elongated generally rectangular arm member having mounting apertures formed proximate the ends of the second arm member, which is adapted to overlie at least a portion of both said first elongated generally rectangular arm member and said piece of lumber for captively engaging said piece of lumber against the plate member;

a plurality of securing members adapted to engage the angle guide unit and the hold down clamp unit to the angle plate unit wherein one of the plurality of securing members extends through at least one of the mounting apertures in the hold down clamp unit, the angle guide unit and the angle plate unit; and another of the plurality of securing members extends through the elongated slot in the first arm member and a selected one of the plurality of angle defining apertures; and,

an auxiliary table saw guide unit including an elongated generally thin slat member which is adapted to be secured beneath said angle plate unit.

4,892,022

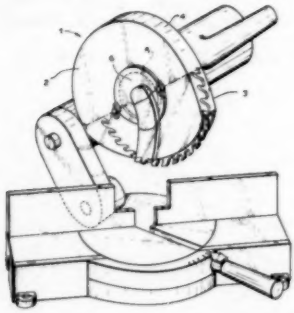
SAFETY GUARD FOR SAWING POWER TOOL PARTICULARLY MITRE SAW

Lawrence M. Cotton, and John C. Derler, both of New Bern, N.C., assignors to Robert Bosch Power Tool Corporation, New Bern, N.C.

Filed Sep. 20, 1988, Ser. No. 246,614

Int. Cl.[4] B27B *5/18*; B23D *45/04*

U.S. Cl. 83—478 **14 Claims**



1. A saw blade guard for a sawing power tool, particularly a mitre saw, comprising a protective element having two side walls each formed as a part of a circle, and a peripheral wall connecting said side walls with one another, said side walls having a center and an edge spaced from said center, said protective element being formed as an integral element and provided with means in the region of said edge for turning said protective element as a whole, one of said side walls of said protective element being provided with a central opening for allowing access to a saw blade shaft of the sawing power tool; a cover associated with said central opening and movable between a first position in which it is spaced from said central opening to allow access to the saw blade shaft and a second position in which it covers said central opening.

4,892,023

ELECTRONIC KEYBOARD PERCUSSION INSTRUMENT

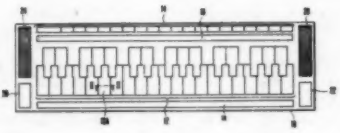
Akihiko Takeuchi, and Masaaki Mizuguchi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 110,617, Oct. 19, 1987, abandoned, which is a continuation of Ser. No. 850,212, Apr. 10, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 302,113

Claims priority, application Japan, Apr. 16, 1985, 60-80913

Int. Cl.[4] G10H *1/053, 1/34, 5/02*

U.S. Cl. 84—687 **16 Claims**



1. An electronic keyboard percussion instrument of a type to be struck with a striking member by a player comprising:

a plurality of pressure sensitive plates respectively corresponding to note names of musical tones to be produced and aligned parallel to each other;

a plurality of striking detecting means, each of which detects when a corresponding pressure sensitive plate is struck with said striking member by the player and generates a first striking detection signal representing a note name of the struck pressure sensitive plate and further generates a second striking detection signal representing a musical tone element modifier characteristic of a manner in which the player has struck the struck pressure sensitive plate;

a tone assignor for assigning said first and second striking detection signals to one of a plurality of tone channels; and

musical tone generating means coupled to said plurality of tone channels for generating a musical tone corresponding to said note name and said musical tone element modifier.

4,892,024

STRUCTURE OF KEYBOARD USED IN ELECTRONIC KEYBOARD INSTRUMENT

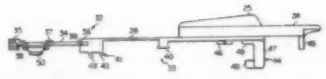
Keisuke Watanabe, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Aug. 4, 1988, Ser. No. 228,230

Claims priority, application Japan, Aug. 7, 1987, 62-197791

Int. Cl.[4] G10H *1/00*; G10C *3/12*

U.S. Cl. 84—719 **20 Claims**



1. A keyboard structure incorporated in an electronic keyboard instrument, comprising:

(a) a plurality of key members each having a front end portion and a rear end portion, said front end portion being depressed by a player of said electronic keyboard instrument;

(b) a plurality of flexible connecting members each coupled to the rear end portion of each key member;

(c) a retainer member for retaining a circuit board and being coupled to each of said flexible connecting members which connects the retainer member and said key member; and

(d) a plurality of key switches disposed on said circuit board, said retainer member retaining said circuit board so that each of said key switches opposes associated one of said key members, wherein said key members, said flexible

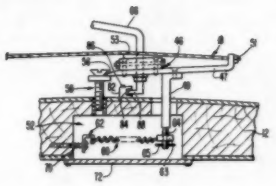
connecting members and the retainer member are formed into a singular piece.

4,892,025

TREMOLO DEVICE HAVING AN ADJUSTABLE COUNTERSPRING AND LOCK

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Jul. 22, 1988, Ser. No. 223,095
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—313 **9 Claims**



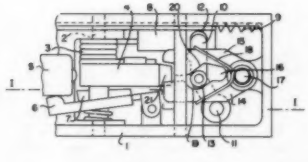
1. A tremolo device for a stringed instrument having a body and a plurality of strings comprising:
tailpiece means for anchoring and moving one end of the strings;
pivot means for pivotally mounting said tailpiece means on the body;
counterspring means for providing a force on the tailpiece means which opposes tension of the strings on the tailpiece means, the counterspring means having a first end and a second end and extending in a first direction between the first end and the second end;
means for attaching the first end of the counterspring means to the body; and
means for attaching the first end of the counterspring means to the tailpiece means and for varying the distance from the tailpiece means to the second end of the counterspring means by moving the second end of the counterspring means relative to the tailpiece means in a direction generally perpendicular to the first direction to vary the moment applied to the tailpiece means by the force of the counterspring means.

4,892,026

HAND-HELD AUTOMATIC FIREARM

Friedrich Aigner, St. Valentin, Austria, assignor to Steyr-Daimler-Puch AG, Postrach, Austria

Filed Sep. 8, 1988, Ser. No. 241,854
Claims priority, application Austria, Sep. 22, 1987, 2393/87
Int. Cl.[4] F41C *5/00*
U.S. Cl. 89—140 **6 Claims**



1. In a hand-held automatic firearm comprising
a receiver,
a breechblock, which is reciprocably mounted in said receiver for forward and recoil movements, and
a trigger mechanism mounted in said receiver and comprising
a hammer spring,
a hammer, which is pivoted to said receiver and arranged to be cocked against the force of said hammer spring by said breechblock during its recoil movement,
a sustained-fire lever, which is controlled by the breechblock and arranged to lock the hammer when said hammer is cocked under control of the breechblock during its forward movement,
a hammer extension, which is carried by said hammer and is movable by said hammer along a predetermined path,
a trigger slider, which is slidably mounted in said receiver for a movement from an initial position through a single-shot position and further to a sustained-fire position,
a trigger, which is pivoted to said receiver and operatively coupled to said trigger slider and is adapted to be pulled from an initial position to move said trigger slider from its initial position to said single-shot position and further to said sustained-fire position,
a trigger spring urging said trigger slider and said trigger to their respective initial positions, and
a pair of levers, which respectively comprise a release lever and a disconnector lever and are movable each into said predetermined path to a catching position in response to the movement of said trigger slider to either of said single-shot and sustained-fire positions,
the improvement residing in that
said release lever and said disconnector lever are pivoted on to said receiver on a common upright vertical axis and have confronting camming side edges, which define between them a cam slot,
a camming member is movably mounted in said receiver and is coupled to said trigger slider and is arranged to perform in response to pulling of said trigger a movement relative to said camming edges in engagement therewith and by said movement to impart to said pair of levers in dependence on one of the aforementioned positions assumed by said trigger slider, a movement of said pairs of levers from an initial position to a single-shot position when said trigger slider is in its single-shot position and to a sustained-fire position when said trigger slider is in its sustained-fire position,
a restoring spring is operatively connected to said pair of levers and urges them to their initial position,
said release lever is arranged to engage said hammer extension when said pair of levers are in their initial position and said hammer is cocked and to release said hammer extension when said pair of levers are in their single-shot position,
said disconnector lever is arranged to extend into said predetermined path when said pair of levers are in their sustained-fire position.

4,892,027

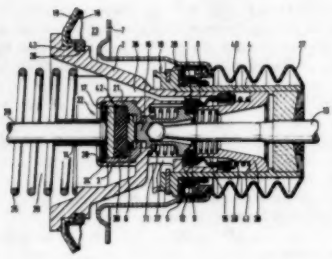
VACUUM BRAKE POWER BOOSTER FOR AUTOMOTIVE VEHICLES AND METHOD FOR ITS MANUFACTURE

Wilfried Wagner, Huettenberg-Weidenhausen, and Lothar Schiel, Hofheim-Lorsbach, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,327
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709172
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369.2 **8 Claims**

1. A vacuum brake power booster for automotive vehicles comprising a vacuum Casing which is sealingly subdivided by an axially movable wall into a vacuum chamber and a working chamber a mechanically actuatable control valve connecting the working chamber to the vacuum chamber and to atmosphere, the axially movable control valve having a casing being made of thermoplastics and accommodating in an axial bore therein an elastomeric reaction plate, said reaction plate abuts on a head flange of a push rod adapted to transmit a brake force onto an actuating piston of a master cylinder mountable

onto the vacuum casing, the movable wall being coupled to the control valve casing, a guide sleeve on said control valve casing adapted to axially guide the push rod therein said guide sleeve includes a radial flange wherein the radial flange of the



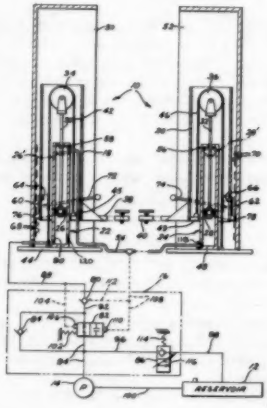
guide sleeve is axially supported inside the bore of the control valve casing accommodating the reaction plate and said guide sleeve axially embraced by a retaining member in positive engagement with said guide sleeve, said retaining member being connected to the control valve casing.

4,892,028

FLUID OPERATED CIRCUIT FOR CONTROLLING A DUAL POST HYDRAULIC LIFT ASSEMBLY

Bernard R. Stivers, Louisville, Ky., assignor to VBM Corporation, Louisville, Ky.

Filed Sep. 10, 1984, Ser. No. 648,503
Int. Cl.[4] B66F *3/46, 7/04, 7/20*
U.S. Cl. 91—517 **11 Claims**



11. For use with a dual post article lift assembly of the type which includes a hydraulically operated drive cylinder containing a movable piston connected to a piston rod, a hydraulically operated idler cylinder containing a movable piston connected to a piston rod, said cylinders being hydraulically connected in series such that upward and downward movements of said idler cylinder piston are dependent upon corresponding movements of said drive cylinder piston, and article supporting means nonfixedly connected to each of said rods such that upward movements of said pistons produce upward movements of said article supporting mean and such that downward movements of said pistons occur independently of movements of said supporting means, a fluid operated circuit for controlling the descent of said pistons comprising

a pilot operated check valve connectable for fluid flow therethrough to a lower end of said drive cylinder and responsively connectable to the lower ends of both of said cylinders for opening and remaining open for fluid flow therethrough when and so long as the ratio of the pressure of a fluid in a lower end of said idler cylinder to the pressure of a fluid in the lower end of said drive cylinder is at least as great as a predetermined minimum value indicative that the article supporting structure associated with said idler cylinder is unrestrained and free to descend as said pistons descend, said first valve being adapted to close to prevent the drainage of a fluid from said drive cylinder when said ratio is less than said value,

a first two-position control valve having an open and a closed position connected for fluid flow therethrough to said pilot operated check valve,

spring biasing means connected to said first valve and adapted to provide a preselected minimum bias pressure on said first valve which tends to maintain said first valve in an open position,

fluid biasing means responsively connectable to the lower end of said drive cylinder and operatively associated with said first valve tending to maintain said first valve in an open position,

fluid counterbiasing means responsively connectable to the lower end of said idler cylinder and operatively associated with said first valve in opposing relation to said spring and fluid biasing means for shifting said first valve to a closed position when the pressure of a fluid in the lower end of said idler cylinder exceeds the sum of the pressures of a fluid in the lower end of said drive cylinder and said spring biasing means indicative that the article supporting means associated with said drive cylinder is restrained from descending while said pistons are descending, and

a second check valve connected in shunting relation across said first valve and being adapted to close when said first valve is in an open position and being adapted to open to permit hydraulic fluid to be pumped around said first valve, to and through said pilot operated valve and into said drive cylinder when said first valve is closed so that the fluid pressure in said drive cylinder will be raised to shift said first valve from a closed to an open position.

4,892,029

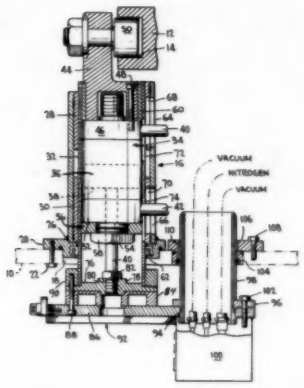
POSITIONING DEVICE

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Jun. 16, 1988, Ser. No. 207,506
Int. Cl.[4] F01B *3/00, 15/00*
U.S. Cl. 92—51 **14 Claims**

1. A positioning device particularly adapted for positioning and applying a member such as a sealing head, said positioning device comprising a mounting plate having an opening therethrough, a guide sleeve mounted on said plate in centered relation to said opening, an extensible fluid motor mounted within said guide sleeve for movement axially of said guide sleeve, a cam, said cam having a cam surface varying in distance from said said mounting plate, a cam follower carried by said fluid motor and engaged with said cam surface to vary the position of said fluid motor relative to said mounting plate, said fluid motor including a movable shaft, fluid means connected

to said fluid motor for selectively extending and retracting said movable shaft independently of the position of said fluid motor



relative to said guide sleeve, and mounting means carried by said movable shaft.

4,892,030

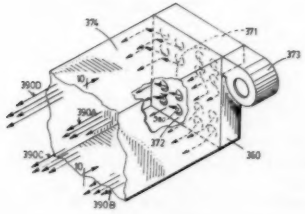
AIRFLOW DISTRIBUTION SYSTEM FOR DISCHARGING AIR FROM A THIN PLENUM, AND OVEN EMPLOYING SAME

Douglas V. Grieve, Lake Forest, Ill., assignor to The Grieve Corporation, Round Lake, Ill.

Division of Ser. No. 217,392, Jul. 11, 1988, Pat. No. 4,869,155. This application Jul. 10, 1989, Ser. No. 377,143

Int. Cl.[4] A21B *1/26*

U.S. Cl. 98—1 **10 Claims**



1. An airflow distribution system comprising: an inlet plenum chamber, a discharge duct extending along a longitudinal axis intersecting said plenum chamber, and a fluid distribution plate forming a common wall therebetween;

said plenum chamber having inlet and outlet means for directing a flow of fluid through the plenum chamber into the duct;

said outlet means comprising a plurality of discharge openings in said distribution plate arranged in a predetermined array around said longitudinal axis, said plate having diagonal louvers secured to the edges of said openings, said louvers having substantially the same orientation relative to said longitudinal axis to thereby direct individual streams of fluid outwardly from the distribution plate into and along the discharge duct where the individual streams merge and combine into a resultant fluid stream flowing along said axis through a predetermined portion of the cross sectional area of the discharge duct.

4,892,031

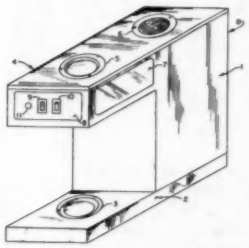
MODULARIZED CUSTOM BEVERAGE BREWER

Joseph P. Webster, and William L. Gustafson, both of St. Charles, Mo., assignors to Newco Research Corporation, St. Charles, Mo.

Continuation of Ser. No. 41,878, Apr. 23, 1987, Pat. No. 4,829,888. This application May 1, 1989, Ser. No. 345,365

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—284 **20 Claims**



1. In a modular fabricated custom formed beverage brewer of the type incorporating a component formed housing containing a hot water heating tank regulated by controls for heating water delivered to the tank by one of an automatic cold water inlet supply or a pour-in type for heating and delivery of water to a spray head for discharge onto a basket of beverage grounds for dripping of a brewed beverage to a decanter for consumption, the improvement which comprises, said housing being convertible for multiple usage through replacement and relocation of select of its components during assembly of the brewer housing, said beverage brewer incorporating a base member, an upright column means for use in containing the water heating tank, and an upper cantilevered portion mounted upon and extending forwardly of the column means, said combined base member, upright column means, and upper cantilevered portion disposing a front, left, and right sides for the constructed brewer, and said brewer being adaptable for providing one of a front, left or right side delivery of the decanter to and from the brewer during its application, control switch means provided upon the upper cantilevered portion, said control switch means being connectable upon one of the front, left or right sides of the said cantilevered portion, said control switch means being interchangeable between said front, left or right sides of the said cantilevered portion, and wherein said base member being interchangeable between one of a forwardly extending base member, a vertically extending height increasing base member, or a laterally mounting base member for the beverage brewer.

4,892,032

COOKING SPITS

Henry Jerome, 1689 Sherway Drive, Mississauga, Ontario L4X 1C8, Canada

Filed Nov. 28, 1988, Ser. No. 276,933

Int. Cl.[4] A47J *37/04*

U.S. Cl. 99—421 HV **6 Claims**

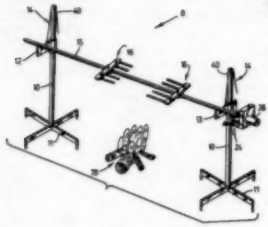
1. A portable cooking apparatus comprising:

(a) a pair of longitudinally elongated stanchions which are free of attachment to one another so as to be independently positioned in a generally upright manner in use,

(b) a spit rod support member mounted on each stanchion, each spit support member being formed to provide a seat for supporting a spit for rotation thereon about a first longitudinal axis which extends transversly between the seats in use,

(c) a motor support bracket for supporting a drive motor with its power output shaft aligned with said first longitudinal axis,

(d) mounting means connecting said first spit rod support member and said motor support bracket and providing simultaneous freedom of movement of the motor support bracket with respect to the spit rod support member about



a generally vertical and generally horizontal axis which serve to permit the motor support bracket to move simultaneously about the vertical and horizontal axes with respect to its associated stanchion to be aligned with the power output shaft of the motor and the spit rod in use.

4,892,033

METHOD AND APPARATUS FOR CONTINUOUS PROCESSING OF SUBSTANCES CONTAINING COCOA BUTTER OR SIMILAR FATS

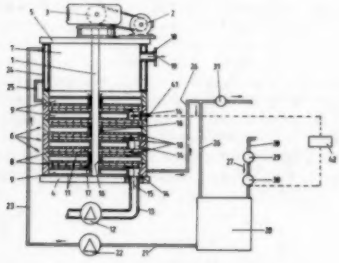
Helmut Sollich, Rabenkirchen, Fed. Rep. of Germany, assignor to Sollich GmbH & Co. KG, Bad Salzuflen, Fed. Rep. of Germany

Division of Ser. No. 188,462, Apr. 29, 1988, Pat. No. 4,859,483. This application Jan. 11, 1989, Ser. No. 295,518

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714663

Int. Cl.[4] A23C *3/04*; A23G *1/18*

U.S. Cl. 99—455 **15 Claims**



1. Tempering machine for substances containing cocoa butter and similar fats, particularly chocolate masses, comprising: at least one mass chamber with mixing and stirring elements and a cooling stage having heat-exchange surfaces; a cooling circuit with a cooling medium therethrough connected to said cooling stage, said masses being cooled through heat exchange at said heat-exchange surfaces; a heating stage with heat-exchange surfaces; a tempering circuit with a tempering medium connected to said heating stage, said masses being reheated after being cooled through heat exchange at said heat-exchange surfaces of said heating stage; said heat exchange surfaces of said heating stage being at least 40% of the sum of said heat-exchange surfaces of said cooling stage and said heating stage for maintaining a constantly regulated temperature of the heat-exchange surfaces of said heating stage.

4,892,034

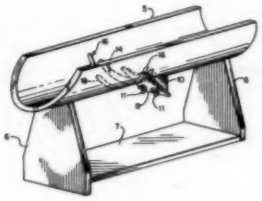
CORN CUTTER AND CREAMER

Charles B. Miles, 4551 Woodland Brook Dr., Atlanta, Ga. 30339

Filed Oct. 31, 1988, Ser. No. 264,982

Int. Cl.[4] A47J *17/00*

U.S. Cl. 99—567 **3 Claims**



1. Apparatus for cutting kernels of corn from a cob and optionally extracting cream from said cob, said apparatus comprising:

(a) an elongated trough extending along a linear axis and having an essentially uniform, U-shaped cross section perpendicular to said axis providing laterally spaced side walls on opposite sides of a bottom wall having a concave inner surface;

(b) support structure including a pair of parallel, upright members each fixedly attached to said trough adjacent opposite ends thereof to hold said trough with said axis substantially horizontal and said side walls extending upwardly, and a horizontally disposed member extending between and fixedly attached to each of said upright members adjacent the lower ends thereof, said substantially disposed member having an upwardly disposed surface adapted to support an open container below said trough;

(c) at least one lower opening extending through said bottom wall and having upper edges in said side walls of said trough;

(d) a first blade having a relatively sharp, concave, cutting edge;

(e) a support block fixedly attached to said trough on the outer surface of said bottom wall adjacent said lower opening;

(f) means securing said first blade to said support block with said blade extending through said lower opening and said cutting edge disposed laterally across said trough above said concave inner surface, said securing means permitting selective positioning of said cutting edge between minimum and maximum distances above the plane of said inner surface;

(g) a second blade having a relatively dull, concave, scraping edge;

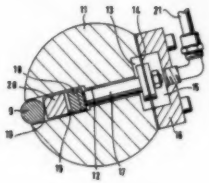
(h) a pair of laterally aligned side openings extending through said side walls, said second blade and said side openings being respectively dimensioned for freely sliding movement of said second blade through said side openings to removably support said second blade upon said trough above said lower opening with said scraping edge extending laterally across said trough and spaced above the plane of said inner surface by a distance greater than said maximum distance, whereby a cob with the kernels removed may be drawn over said scraping blade when the latter is positioned in said side openings to remove the cream from said cob without contacting said first blade cutting edge.

4,892,035

CONTINUOUS DAMPING MEANS FOR OFF-SET PRINTING MACHINES

Giancarlo Terzuolo, Turin, Italy, assignor to Grapho Engineering s.r.l., Bologna, Italy

Filed Aug. 11, 1988, Ser. No. 231,185
Claims priority, application Italy, Aug. 17, 1987, 67719
Int. Cl.[4] B41L *25/02*
U.S. Cl. 101—148 **12 Claims**



1. An apparatus for the continuous damping of off-set printing machines comprising:

a reservoir **(3)** for damping liquid;

a feed roller **(4)** mounted for rotation and being at least partially inserted in said reservoir **(3)** for taking up said damping liquid by rotating therewithin;

an adjustable speed motor **(5)** for driving said feed roller;

means for the controlled application of said damping liquid to the surface of said feed roller; said application means extending transversely to the direction of rotation of said feed roller substantially over the entire length thereof and comprising a rigid support bar **(11)** having an axial peripheral groove **(10)** therein, said bar **(11)** being located at a distance from the periphery of said feed roller **(4)** emerging from said damping liquid; a linear elongated elastic wiper element **(9)** movably housed within said groove and having one side facing said feed roller and being in contact with the surface of said feed roller;

means **(13–20)** for pressing said wiper element against said surface of said feed roller;

means **(21)** in operative communication with said pressing means for regulating the pressure with which said wiper element is pressed against said surface of said feed roller; and

means for controlling said adjustable speed motor **(5)** and said regulating means **(21)**.

4,892,036

COMBINATION COLLECTION AND FOLDING CYLINDER SYSTEM

Klaus-Ulrich Lange, Gersthofen, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,538
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810439
Int. Cl.[4] B41F *13/64*
U.S. Cl. 101—240 **9 Claims**

1. Combination collection or assembling and folding cylinder **(9)** for sheet products having

folding blades **(12)** controllably projectable from the cylinder;

a first control means including

a fixed blade control cam **(23)**;

a movable blade control cam cover disk **(62)** having a blade camming surface,

said fixed blade control cam and blade cover disk conjointly defining a blade control curve;

a first pivoted cam follower **(15)** in controlled engagement with said blade control curve and coupled to said folding blades for controlling projection thereof;

puncture needles **(10)** controllably projectable from the cylinder **(9)**;

a second control means including

a fixed needle control cam **(25)**;

a movable needle control cam cover disk **(61)** having a needle camming surface,

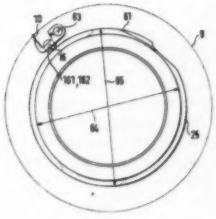
said fixed needle control cam and needle cover disk conjointly defining a needle control curve;

a second pivoted cam follower **(16)** in controlled engagement with said needle control curve and coupled to said needles for controlling projection thereof; and

means for relatively changing the angular position of said cover disks with respect to the associated cams independently of machine operation to permit change-over between operation of the cylinder, selectively, in sheet product collecting or assembling mode, or non-collecting mode,

said changing means comprising

a coupling gear **(29)** secured to a hollow shaft;



bearing means **(19)** journalling a cylinder shaft **(17)** projecting from the cylinder;

a gear **(20)** coupled to the cylinder shaft and driven by a main machine drive;

means **(20)** for driving said coupling gear **(29)** from the main machine drive;

adjustable means **(28, 36, 37, 58, 60)** for drivingly coupling disks **(61, 62)** to said coupling gear **(29)** including

a worm **(28)** defining worm flanks, and a worm shaft **(26)** extending from said worm, positioned within said hollow shaft and

roller bolts **(36, 37)** in engagement with the worm flanks and coupled to the coupling gear **(29)**; and

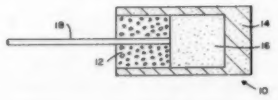
means **(57, 56, 50)** for relatively axially shifting the coupling gear **(29)** and hence the roller bolts on the worm to superimpose an additional rotation on said coupling gear **(29)** on the rotation derived from the main machine drive to thereby shift the relative angular position of the cover disks with respect to said cams.

4,892,037

SELF CONSUMABLE INITIATOR

Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1989, Ser. No. 293,157
Int. Cl.[4] F42C *19/08*
U.S. Cl. 102—201 **5 Claims**



1. A self consumable initiator including a consumable material in combination with a fiber optic material which functions

to conduct laser energy from a laser source to said consumable material to thereby stimulate said consumable material to its ignition point and thereafter said consumable material self consumes, said self consumable initiator comprising:

(i) A consumable composition selected from the group of easily - ignitable compositions specified under pyrotechnic groups A-C as follows:

Pyrotechnic group A: metal fuel-oxidizer, composition 1: magnesium 60% by weight and polytetrafluorethylene 40% by weight, composition 2: boron 23.7%±2% by weight, potassium nitrate 70.7%±2% by weight, and binder 5.6% by weight; composition 3: zirconium 10 microns particle size 45% by weight and potassium perchlorate 6 to 17 microns particle size 55% by weight; and composition 4: aluminum flake 17 to 44 microns particle size 45% by weight and potassium perchlorate 6 to 17 microns particle size 55% by weight;

Pyrotechnic group B: primary explosive, composition 1: lead acids; and composition 2: lead styphnate; Pyrotechnic group C; propellants, composition 1: double-base propellants; composition 2: single base propellants, composition 3: composite propellants; and composition 4: black powders; and,

(ii) One or more lengths of a fiber optic material in contact with said consumable composition, said one or more lengths of a fiber optic material adapted for receiving laser energy of a uniform energy density from a laser source whereby said consumable composition is stimulated to its ignition point and thereafter self consumes.

4,892,038

CARTRIDGED AMMUNITION

Willi Lubbers, Trittau, Fed. Rep. of Germany, assignor to Nico-Pyrotechnik Hanns-Jürgen Diederichs GmbH & Co. KG, Trittau, Fed. Rep. of Germany

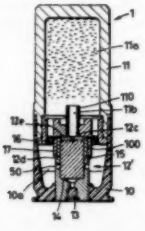
Continuation of Ser. No. 157,481, Feb. 22, 1988, Pat. No. 4,815,387, which is a division of Ser. No. 948,359, Nov. 5, 1986, Pat. No. 4,762,068. This application Dec. 6, 1988, Ser. No. 287,261

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507643

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—439 **20 Claims**



1. Cartridged ammunition for a grenade pistol, comprising:

a cartridge casing having a base and an opening;

a projectile disposed in the casing opening, the projectile including a base with a connecting thread, a payload, and at least one charge;

primer and propelling charges; and

a cup at the base of the casing, the primer and propelling charges being disposed in the cup, the cup including a sleeve and means for providing a firing channel oriented toward the at least one charge included in the projectile, wherein the sleeve has a free end section with an external thread followed by an annular, circumferential predetermined break location, and wherein the sleeve is fastened to the base of the projectile by way of the connecting thread.

4,892,039

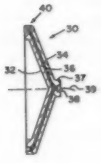
RING DETONATOR FOR SHAPED-CHARGE WARHEADS

John D. Emerson, Arab, and Scott D. Hill, Toney, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1989, Ser. No. 321,688

Int. Cl.[4] F42B *11/22*

U.S. Cl. 102—476 **2 Claims**



1. A ring detonator for a warhead comprising:

(i) an outer conically shaped member having the shape of a modified frustum of a circular cone, said outer conically shaped member having a slant height extending at a predetermined angle and for a predetermined distance to a larger base of said conically shaped member to form the outer ring of said ring detonator that has a diameter of about two thirds the diameter of the warhead with which the ring detonator is employed;

(ii) a cylindrical member extending from the smaller base of said outer conically shaped member which completes the shape to said modified frustum of a circular cone, said cylindrical member having a cavity therein for containing a point detonator charge, said cylindrical member having an opening extending from said cavity through the center line of said smaller base of said outer conically shaped member to an opening provided by mating said outer conically shaped member with an inner conically shaped member;

(iii) an inner conically shaped member mated with said outer modified frustum of a circular cone shaped member in a spaced apart relationship to define a space therebetween for containing an explosive composition, said inner conically shaped member extending at said predetermined angle and for said predetermined distance as defined for said outer conically shaped member to form the inner portion of said ring of said diameter defined hereinabove; and,

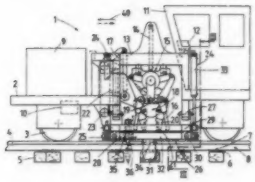
(iv) a common cylindrically shaped member extending from the larger bases of said outer and inner conically shaped members, said common cylindrically shaped member having an opening extending therethrough to said defined space for containing said explosive composition, said opening permitting the discharge from said formed ring of said ring detonator the detonation shock wave and detonation products from said explosive composition after ignition to thereby effect the transfer of a point detonator charge to said formed ring whereby said ring detonator creates a flatter wave front in a shorter distance to achieve initiation of a warhead by said ring detonator.

4,892,040

BALLAST TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie GmbH, Vienna, Austria

Filed May 20, 1988, Ser. No. 196,672
Claims priority, application Austria, Mar. 8, 1988, 613/88
Int. Cl.[4] E01B *29/10*
U.S. Cl. 104—6 **14 Claims**



1. In a mobile machine for tamping ballast under ties of a railroad track, each of the ties having opposite longitudinal sides extending transversely to the track, which comprises a machine frame, spaced undercarriages supporting the machine frame for mobility on the railroad track in an operating direction, and a ballast tamping assembly mounted on the machine frame and comprising a vertically adjustable tamping tool carrier, a drive for vertically adjusting the tamping tool carrier, pairs of vibratory and reciprocatory tamping tools immersible in the ballast upon vertical adjustment of the tamping tool carrier and defining a transversely extending plane of symmetry therebetween, and drives for vibrating and reciprocating the tamping tools; the combination of

(a) a first device associated with the ballast tamping assembly for gripping and transversely positioning a respective one of the ties, the first device including

(1) a drive for vertically adjusting the device and

(2) pivotally adjustable tongs for gripping the longitudinal tie sides, and

(b) a second device operable independently of the first device for transversely displacing a respective one of the ties, the second device including

(1) drive means for vertically and transversely adjusting the second device,

(c) the first and second devices being arranged in the plane of symmetry adjacent a respective one of the tamping tool carriers.

4,892,041

GOLF CART SYSTEM

Tomiichi Fukuda, 3-23-18, Denenchofu, Ohta-ku, Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,254
Claims priority, application Japan, Nov. 5, 1986, 61-262932
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[4] B61B *13/10*
U.S. Cl. 104—140 **1 Claim**

1. A golf cart system comprising:

a track adapted to be embedded in the ground,

a cart adapted to run on said track,

said track including

a bottom wall,

a pair of opposed side walls extending generally vertically from said bottom wall, and

top walls extending toward a center of said track from upper ends of said side walls to define a groove therebetween,

said cart including

a base frame,

supporting posts extending vertically and downwardly from said base frame through said groove into said track,

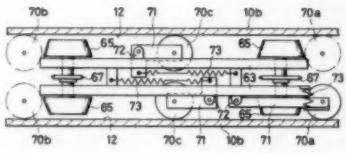
a wheel supporting frame mounted on said supporting posts and being movable within said track,

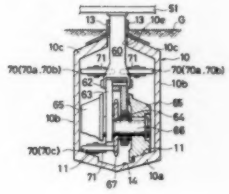
driving wheels mounted on said wheel supporting frame and driven by a power source to run on the inner surface of the bottom wall of the track,

front, rear and central anti-overturn rollers for preventing lateral overturn of said cart and engaging inner surfaces of said side walls, said front and rear rollers engaging said side walls at upper positions thereof and said central rollers being located between said front and rear rollers and engaging the inner surfaces of said side walls at lower positions thereof,

compression spring means for biasing said front rollers and said rear rollers against said side walls, and

tension spring means for biasing said central rollers against said side walls.



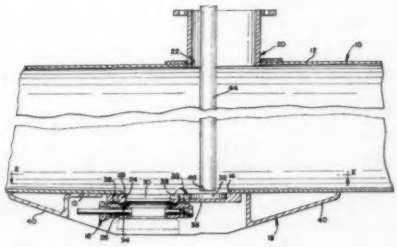


4,892,042

COMBINATION BOTTOM OUTLET SADDLE AND SUMP

Thomas H. Dalrymple, Crown Point, Ind.; Philip J. Daum, Chicago, Ill., and Walter T. Croson, Hammond, Ind., assignors to Union Tank Car Company, East Chicago, Ill.

Filed Dec. 15, 1988, Ser. No. 285,107
Int. Cl.[4] B61D *5/00*
U.S. Cl. 105—362 **8 Claims**



1. In a tank car bottom outlet valve assembly, a combination bottom outlet valve saddle and sump arrangement for attachment to the underside of a tank car in fluid communication with an outlet opening therein, comprising: an integral saddle member having an upper surface shaped to conform to the underside of said tank car for attachment thereto in surrounding relationship with said outlet opening, said saddle member

having an opening formed therein in fluid communication with said outlet opening, a sump integrally formed and recessed into the upper surface of said saddle member longitudinally spaced a short distance from said opening in said saddle member in fluid communication with said outlet opening for receipt of residual lading thereinto, and mounting means formed on a lower surface of said saddle member for mounting a bottom outlet valve thereto in fluid communication with said opening.

4,892,043

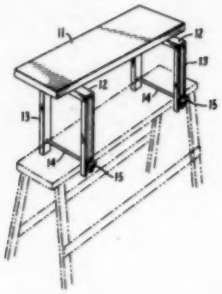
SUBSIDIARY BENCH TOP

Richard H. Schulz, 845 N. L St., Livermore, Calif. 94550

Filed Jul. 6, 1987, Ser. No. 72,645

Int. Cl.[4] A47B 7/00

U.S. Cl. 108—90 **1 Claim**



1. A bench top extension for attachment to a work bench, said bench top extension comprising:

a standing section having longitudinal and lateral dimensions and having longitudinal and lateral ends;

a pair of brackets connected to said standing section near the longitudinal ends of the standing section, said brackets extending partially laterally away from said standing section;

two pairs of downwardly extending support members, each support member having a distal end, one pair of support members connected to each bracket with one support member at each end of each bracket; and

a pair of nut and bolt assemblies interconnecting the distal ends of each pair of support members, each pair of support members and nut and bolt assemblies defining means to secure the bench top extension to a work bench, the bolts to rest on top of a work bench and the nut and bolt assemblies to laterally compress the distal ends of the support members against the sides of a work bench, said standing section being partially laterally offset with respect to a work bench to provide a stepping means from a work bench that is laterally accessible to increase the effective elevation of a work bench.

4,892,044

CORNER STRUCTURE FOR A MODULAR SHELF AND METHOD OF MAKING SAME

John H. Welsch, Moscow, Pa., assignor to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Feb. 24, 1988, Ser. No. 159,918

Int. Cl.[4] A47B 3/06

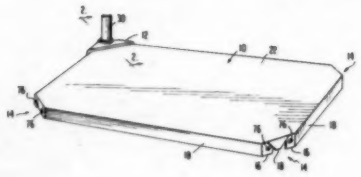
U.S. Cl. 108—154 **15 Claims**

1. A corner structure comprising:

A. a corner connector having:

(1) insert means made of a rigid material and formed to be fastened to a shelf member, said insert means comprising a generally U-shaped brace having an arcuate portion connected to first and second side wall portions, reentrant means in the form of a plurality of tabs disposed on said side wall portions and a plurality of holes formed in said side wall portions, and ear means formed with said side wall portions; and

(2) housing means made of a non-corroding resinous material and encapsulating a major portion of said insert means, said housing means being formed about said insert means to be integrated therewith with said resinous material received within and filling said plurality of holes and received about said plurality of tabs forming said reentrant means, said housing means and said insert means together defining means for receiving a support member; and



B. means cooperating with said ear means of said brace for securing said corner connector to a shelf member.

4,892,045

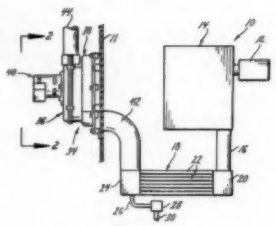
CONDENSATE DRAIN SYSTEM

David B. Schumacher, St. Louis, Mo., assignor to Snyder General Corporation, Red Bud, Ill.

Filed Sep. 22, 1988, Ser. No. 247,633

Int. Cl.[4] F23J 15/00

U.S. Cl. 110—203 **19 Claims**



12. A system for collecting and draining condensate from a heating apparatus comprising;

a blower means;

a condenser means; and

a passage means between the condenser means and the blower means, the passage means being adapted to convey combustion products and condensate from the condenser means to the blower means, and also being adapted to collect, substantially all of the condensate conveyed and drain the condensate from the heating system.

4,892,046

FURNACE ROOF AND METHOD OF CONSTRUCTING THE SAME

John R. Gillespie, Ballwin, Mo., assignor to Gillespie & Powers, Inc., St. Louis, Mo.

Filed Oct. 30, 1987, Ser. No. 115,167

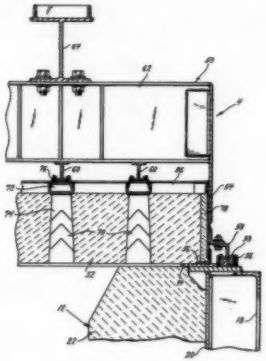
Int. Cl.[4] F23M 5/06

U.S. Cl. 110—332 **21 Claims**

1. A furnace for melting metal, said furnace comprising: a containment vessel having a side wall and a floor for containing a pool of molten metal, and a roof normally closing the top

of the containment vessel, but being separable from the containment vessel so that it can be removed as a unit from the containment vessel, the roof including a framework that extends across the top of the containment vessel and has a metal band along its periphery, anchors attached to the framework, and a refractory cast about and interlocked with the anchors within the confines of the band so that the anchors hold the refractory to the framework, the refractory being carried on the framework such that the refractory is presented downwardly and exposed to the interior of the containment vessel.

20. A process for constructing the roof of a furnace for melting metal, said process comprising constructing a framework having cross members; placing the framework over a horizontal surface with the cross members spaced from the surface; placing a metal band around the space between the cross members and the surface at the periphery of the framework; attaching anchors to the framework such that the anchors are in the space between the framework and the horizontal surface and within the confines of the metal band; pouring a moldable refractory mix onto the horizontal surface within the confines of the metal band and around the anchors; vibrating the horizontal surface to cause the moldable mix to flow over the surface and around the anchors; and allowing the refractory mix to set up into a solid refractory that is interlocked with the anchors.

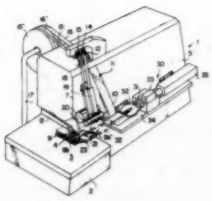


4,892,047

SEWING MACHINE FOR FEEDING AND CUTTING RIBBON LIKE PIECES OF DIFFERENT WIDTHS

Giorgio Fieschi, Buccinasco - Milan, Italy, assignor to Rockwell-Rimoldi, S.p.A., Oicella, Italy

Filed Jul. 13, 1988, Ser. No. 218,716
Claims priority, application Italy, Oct. 9, 1987, 22209 A/87
Int. Cl.[4] D05B *35/10, 37/04*
U.S. Cl. 112—122 **2 Claims**



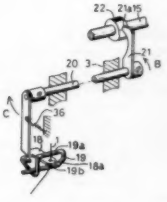
1. A sewing machine for feeding and cutting ribbon-like pieces of different widths comprising a presser foot having an engagement seat in a front portion of the presser foot for guiding said ribbon-like pieces under said presser foot through a slit extending downwardly from said engagement seat, feed means for feeding said ribbon-like pieces to said engagement seat, and cutting means for cutting pieces of trimmings between said feed means and said engagement seat, said presser foot having an adjusting element slidably carried in a region of said engagement seat, said adjusting element being provided with a boundary tab extending inside of said engagement seat for defining the width of the engagement seat depending upon the ribbon-like trimming width; said cutting means having a cutting unit slidably mounted on a guide means carried by said sewing machine, and positioning means for moving said cutting unit from a rest position spaced apart sideways from said engagement seat to a cutting position disposed in front of said engagement seat wherein when said cutting unit is positioned by said positioning means in the cutting position, an operating cylinder of said cutting unit is actuated and it further moves forward a shear means for carryng out a cutting operation on ribbon-like trimming and, vice-versa, when said cutting operation has been completed by said cylinder, said positioning means returning said cutting unit to said rest position away from said engagement seat.

4,892,048

AUTOMATIC THREAD TIGHTENING DEVICE FOR A SEWING MACHINE

Noboru Karuga, Hachioji; Kazumasa Hara, Hino; Mikio Koike, Qume, and Mitsuru Nishijima, Tachikawa, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 109,929, Oct. 19, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,899
Claims priority, application Japan, Oct. 24, 1986, 61-251589
Int. Cl.[4] D05B *47/04*
U.S. Cl. 112—254 **1 Claim**



1. A sewing machine having a vertically reciprocating needle for holding an upper thread, means of carrying a lower thread and catching the upper thread to form stitches in cooperation with the needle, an upper thread supply, a main thread take-up lever, and an automatic thread tension device, said device comprising an upper thread tension member arranged in a thread running path between said upper thread supply and said main thread take-up lever; an auxiliary thread take-up lever arranged in the thread running path between said main thread take-up lever and said needle and having a thread engaging part for guiding said upper thread; a thread presser arranged laterally of the thread running path between said main and auxiliary thread take-up levers to guide said upper thread from said tension member to said main thread take-up lever, said thread presser being controlled in response to a rotation phase of an upper shaft of the sewing machine to normally clamp said upper thread and to release the same only during a predetermined phase of supplying the upper thread from said supply; a thread guide fixedly arranged adjacent to said auxiliary thread take-up lever; and said auxiliary thread take-up lever being controlled for movement relative to said thread guide into a position in which said thread engaging part cooperates with said thread guide such as to absorb a slackening of the upper thread in said thread running path between the

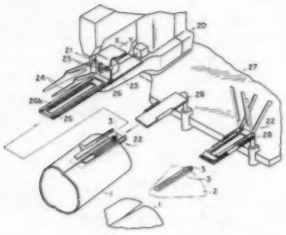
main thread take-up lever and the needle during said supplying phase.

4,892,049

AUTOMATIC SEWING MACHINE EXCLUSIVELY USED FOR SEWING ZIPPER ON WORKPIECE

Tohru Hiramatsu; Kazuya Tami, and Torao Ohchi, all of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Division of Ser. No. 882,884, Jun. 24, 1986, Pat. No. 4,854,251.
This application May 2, 1989, Ser. No. 346,067
Int. Cl.[4] D05B *95/00, 1/00*
U.S. Cl. 112—265.2 **3 Claims**



1. A process for sewing a zipper on a flapped workpiece comprising the steps of:

preparing a zipper having a length longer than a required length by the look of the slider positioned at the leading end of said zipper;

gripping said zipper and flapped workpiece with said slide projecting outwardly beyond the end edge of said workpiece;

operating a sewing machine and moving said zipper and flapped workpiece relative to each other describing an L-shape in a plane vertical to the movement direction of the needle of said sewing machine while holding the zipper and flapped workpiece for sewing a longitudinal straight seam along the inner side edge of the flap and a transverse straight seam;

turning over said flap and moving said zipper and flapped workpiece substantially linearly relative to said sewing machine needle while holding the zipper and flapped workpiece for sewing a longitudinal straight seam on the lower side of said flap;

stopping said sewing machine and effecting thread cutting;

removing said flapped workpiece having said flap sewn thereon from said sewing machine;

retracting said slider halfway in the longitudinal direction of said zipper and then cutting off the portion of the fastener tapes of said zipper projecting outwardly beyond said end edge of the workpiece; and

securing a fastener to said zipper in a predetermined position of the zipper.

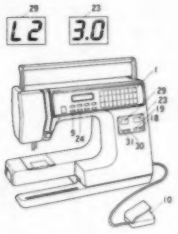
4,892,050

SEWING MACHINE HAVING APPARATUS FOR INDICATING ELONGATED PATTERN MAGNIFICATION

Takumi Ando; Toshitaka Toyomi, and Yasuhiro Osanai, all of Tokyo, Japan, assignors to Janome Sewing Machine Company Limited, Japan

Filed Apr. 29, 1988, Ser. No. 192,418
Claims priority, application Japan, Apr. 30, 1987, 62-107045
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—458 **1 Claim**

1. A sewing machine having pattern selecting means selectively operated to select a pattern to be stitched from a plurality of different patterns stored in a pattern memory, feed pitch setting means operated to set a desired feed pitch value of a selected pattern and simultaneously read out a data corresponding to the set feed pitch value of the selected pattern from a plurality of feed pitch display data stored in a feed pitch data memory which is to be digitally displayed in a first display, stitch amplitude setting means optionally operated to set a desired stitch amplitude value of the selected pattern and simultaneously to read out a data corresponding to the set stitch amplitude value of the selected pattern from a plurality of stitch amplitude display data which is to be digitally displayed in a second display, said sewing machine comprising means for setting an elongating magnification value of the selected pattern; memory means storing a plurality of pattern elongating magnification display data, said memory means being operated in response to operation of said pattern elongating magnification value setting means to produce a pattern elongating magnification display data corresponding to the set elongating magnification value of the selected pattern; means operated in response to operation of said pattern selecting means to discriminate if the selected pattern is elongatable, said discriminating means giving a signal upon confirmation that the selected pattern is elongatable; and switching means operated in response to the signal from said discriminating means and to operation of said pattern elongating magnification value setting means to electrically transmit the data of said pattern elongating magnification display data memory to said second display so as to make the latter digitally display said set elongating magnification value of the selected patterns while electrically disconnecting said stitch amplitude display data memory from said second display.

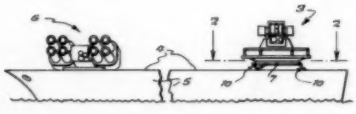


4,892,051

SHOCK ISOLATION METHOD AND APPARATUS FOR SHIP-MOUNTED DEVICE

Douglas P. Taylor, North Tonawanda, N.Y., and David A. Lee, Santa Monica, Calif., assignors to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed May 23, 1984, Ser. No. 613,587
Int. Cl.[4] B63G *13/00*
U.S. Cl. 114—1 **11 Claims**



6. A mounting system comprising a first member, a second member, a plurality of link means which are both rigid and resilient extending between said first and second members for mounting said second member on said first member in a predetermined fixed position when said link means are rigid but which permit movement of said first member in a plurality of directions when said link means are resilient, each of said link means including a link having a spring unit operable in both

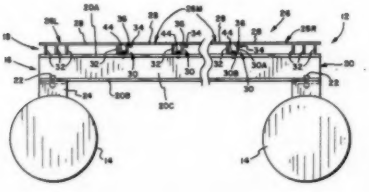
tension and compression, first and second ends on each of said links, first joint means connecting said first ends of said links to one of said members for permitting universal movement therebetween, second joint means connecting said second ends of said links to the other of said members for permitting universal movement therebetween, said links being oriented in a truss configuration comprising a plurality of pairs of said links with the links of each pair being spaced further apart at said second ends than at said first ends and thus diverging between said first and second ends, and said pairs of links being spaced circumferentially about portions of said first and second members, and each of said pairs of links converging toward each other.

4,892,052

BOAT DECKING SYSTEM AND METHOD OF ASSEMBLING SAME

Eldon A. Zook, Churubusco, and Leonard M. Niccum, Angola, both of Ind., assignors to Harris-Kayot, Inc., Lagrange, Ind.

Filed May 4, 1988, Ser. No. 189,995
Int. Cl.[4] B63C *13/00*
U.S. Cl. 114—85 **23 Claims**



21. A method of assembling a boat comprising the steps of:
constructing a deck substructure mounted to a pair of pontoons;
placing a plurality of deck planks on the deck substructure in side-by-side relation to one another to provide a deck platform upon the deck substructure, said planks including respective flanges extending laterally;
the deck planks being placed on the deck substructure one at a time progressing from one side of the deck substructure to the other side thereof alternately with attachment of each plank to the deck substructure from above the substructure before the next plank is placed thereon, the planks being attached to the deck substructure by fastening the flanges to the substructure from above.

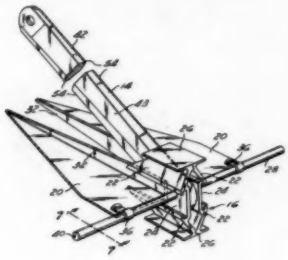
4,892,053

TWIN-FLUKE MARINE ANCHOR HAVING LOOSELY COUPLED FLUKES

Don Hallerberg, 20 Bay Colony La., Ft. Lauderdale, Fla. 33308

Filed Jul. 8, 1988, Ser. No. 216,784
Int. Cl.[4] B63B *21/24*
U.S. Cl. 114—303 **10 Claims**

1. A twin-fluke anchor having a minimal volume within the anchor crown so as to minimize (a) the amount and weight of debris that may accumulate within the anchor crown, (b) restrictions upon angular movement of the anchor shank relative to the anchor crown that may be caused by debris lodged within the anchor crown, and (c) the burying resistance, resulting in higher holding power, said anchor comprising:
a monolithic crown structure;
a pair of flukes attached to said monolithic crown structure; and
a shank rotatably mounted to said monolithic crown structure,
said crown structure having (a) a pair of oppositely disposed crown plates, (b) a pair of oppositely disposed side walls integrally merging into said crown plates along the width of and near the center portion of said crown plates whereby the center portion of said crown plates is thicker than the outer portion of said crown plates, and (c) a pair of oppositely disposed fluke retaining means comprising a slot along the outer width of said side wall opening onto an inset flange receiving member whereby interior volume of said monolithic crown structure is reduced.

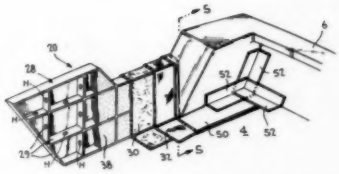


4,892,054

COMPOSITE TRANSOM STRUCTURE

Samuel L. Davidson, Monroe, La., assignor to Mastercrafters Corporation, Winnsboro, La.

Continuation-in-part of Ser. No. 939,687, Dec. 9, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 266,858
Int. Cl.[4] B63B *5/24*
U.S. Cl. 114—357 **20 Claims**



1. In a boat having a hull section and a wall portion on which a drive unit is to be attached, the improvement wherein the wall portion is in the form of a composite structure comprising:
(a) a stiff grid structure having a series of laterally and longitudinally extending ribs defining a series of open sections therebetween;
(b) a hardened filler material filling the open sections between the ribs;
(c) said filler material being bondable to fiberglass layers; and
(d) fiberglass layers on opposite sides of the grid bonded together by the filler material trapping the grid therebetween and further wherein the boat includes at least one layer of material extending at least partly over said wall portion, across a joint between the wall portion and the hull section, and at least partly over the hull section, said layer being chemically bonded to the wall portion and the hull section so as to secure the wall portion and hull section together.

4,892,055

REINFORCED HULL FOR A WATER CRAFT

Robert D. Schad, 110 Bloor Street West, Suite 2104, Toronto, Ontario, Canada

Filed Aug. 5, 1988, Ser. No. 228,496
Int. Cl.[4] B63B *5/24*
U.S. Cl. 114—357 10 Claims

6. A hull structure for an amphibious craft having inboard and outboard sides, a bow and a stern comprising:

a primary hull skin,

a secondary hull skin, and,

means for keying said hull skins together in releasable fashion whereby said primary and secondary hull skins are movable relative to one another,

means for retaining said secondary hull skin against motion in a predetermined direction,

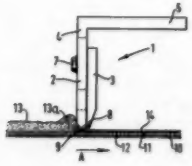
said retention means defining a transverse batten fixed to the stern of the hull overlapping an end portion of said secondary hull skin.

4,892,056

DOCTOR BLADE FOR DOCTORING A FINISH LAYER OF PVC ON A STRIP OF CARPET

Gilbert E. Hawkes, and Susan Fisher, both of southampton, England, assignors to Wilton Royal Carpets Limited, Hampshire, England

Filed Nov. 2, 1987, Ser. No. 115,969
Claims priority, application United Kingdom, Nov. 3, 1986, 8626241
Int. Cl.[4] B05C *11/04*
U.S. Cl. 118—126 5 Claims



1. A doctor blade for doctoring a finish layer of PVC on a strip of carpet, comprising:

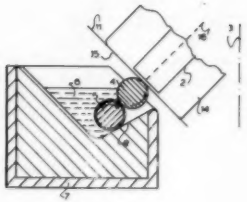
said doctor blade having an upright orientation, and a comb-like form including a straight edge member and a toothed member having teeth, means for securing said members together such that said straight edge member extends across said toothed member covering a portion of said teeth, said straight edge member being chamfered to provide an underface that is narrow in the direction of movement of the strip of carpet, and each of said teeth having a rounded leading lower edge and a width not exceeding 25% of a pitch of said teeth.

4,892,057

DEVICE FOR THE APPLICATION OF SMALL AND MINIMAL AMOUNTS OF FLOWABLE SUBSTANCES

Johannes Zimmer, Ebentaler Strasse 133, A-9020 Klagenfurt, Austria

PCT No. PCT/AT87/00032, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/06504, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 29, 1987, Ser. No. 154,251
Claims priority, application Austria, Apr. 30, 1986, 1178/86
Int. Cl.[4] B05C *1/08*
U.S. Cl. 118—248 6 Claims



1. A device for applying a small amount of a flowable substance to a web of material, comprising:

an application roller juxtaposed with said web;

means for applying a magnetic force to said roller including a beam so that said roller is magnetically pressed against said web said means for applying said magnetic force being a magnetic device generating force at an angle to the vertical and said applicator roller being arranged at said angle to the vertical said beam having a sliding surface where said application roller is slidable thereon; and

a device for feeding the substance to be applied including a dosing roller positioned to dip into the substance in a trough to supply said substance to the applicator roller, the magnetic device being lodged inside of a hollow roller and the applicator roller resting against a shell surface of said hollow roller in a circumferential position opposite the magnetic device, and also resting against said dosing roller, the applicator roller is located between and rests against the hollow roller and the dosing roller, said trough being provided with a surface which is inclined with respect to the hollow roller, the dosing roller or the applicator roller resting thereupon.

4,892,058

PORTABLE PET POTTY AND WETTING WALL

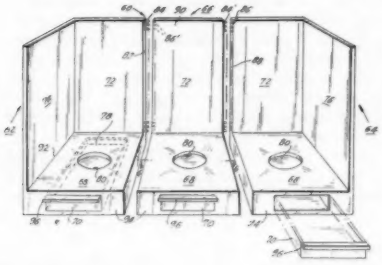
Nanette Clark, 2977 Milton Pl., Bronx, N.Y. 10465

Filed Mar. 10, 1988, Ser. No. 166,231
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 11 Claims

1. A variably sized wetting wall facility for pets, comprising:

a first corner piece and a second corner piece, each of the corner pieces having a respective platform and a back wall, the corner pieces being positioned side by side such that their back walls lie in a common plane, at least one of

the corner pieces including a waste receiving opening in its platform; and



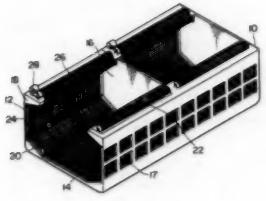
means for joining the respective back walls of the corner pieces to provide a contiguous back wall that serves as a wetting wall and to provide a contiguous platform.

4,892,059

APPARATUS FOR EXCHANGING A NET OF FISH CAGE FOR FARMING FISH

Seiichi Yoneyama, Tokyo, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,547
Claims priority, application Japan, Apr. 8, 1987, 62-52075
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 **12 Claims**



1. A fish breeding apparatus with an exchangeable net comprising:

a hull shaped fish cage having side platings, a bottom plating, screen bulkheads and a deck, said side platings and said bottom plating having openings provided therein;

a net;

pay out means for paying out the net into the cage;

guide means for guiding an end of the net through a predetermined path adjacent said platings; and

coil up means for coiling up the net.

4,892,060

BIRD FEEDER

Timothy Lundquist, Box 386A, Tivoli, N.Y. 12583

Filed Apr. 25, 1988, Ser. No. 185,955
Int. Cl.[4] A01K *39/01*
U.S. Cl. 119—52.2 **10 Claims**

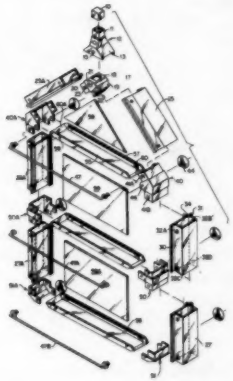
1. A bird feeder having a plurality of gravity-fed seed access stations and adaptable for distribution and storage of a plurality of seed varieties comprising

(a) a detachable loading tube having open entry and exit ends,

(b) a deflector in the tube for directing seed out of the exit end along a path of fall offset from the tube centerline,

(c) a manifold having an upper inlet and dividing into two lower outlets to each side of the manifold centerline, and

(d) distribution and storage chutes descending from the respective manifold outlets to the respective seed access stations,



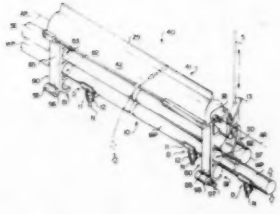
(e) the tube in an operating orientation being adapted to be vertically disposed with its entry end upwardly and aligned over the manifold inlet in a selected rotational position permitting the deflector to direct seed into one or the other or both of the manifold outlets and thence to selected chutes and seed access stations.

4,892,061

DRINKING SYSTEM FOR POULTRY, SMALL ANIMALS AND THE LIKE

Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.

Filed Mar. 1, 1988, Ser. No. 162,540
Int. Cl.[4] A01K *39/02*
U.S. Cl. 119—75 **39 Claims**



1. A drinking mechanism comprising a trough, said trough having a generally upwardly opening mouth when said trough is in an in-use position, means for suspending said trough from a support structure in said in-use position, said trough being movable to a non-use position at which said mouth is in a generally downardly opening position, first locking means for releasably locking said trough in said non-use position, and drinker means for delivering water in a generally downward direction when said trough is in said non-use position.

4,892,062

SHEEP HANDLING AND MANIPULATION FOR AUTOMATED SHEARING

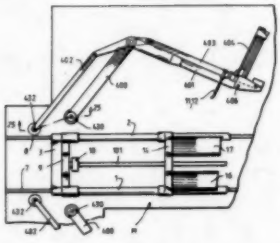
David Elford, Mount Hawthron, Australia, assignor to The University of Western Australia, Nedlands, Australia

Filed Sep. 9, 1988, Ser. No. 242,757

Claims priority, application Australia, Sep. 9, 1987, PI4317; Jul. 15, 1988, PI9319

Int. Cl.[4] A61D *3/00*

U.S. Cl. 119—98 **10 Claims**



1. A system for handling animals such as sheep and goats in the automated treatment of such animals, comprising a multiplicity of animal supporting devices carrying means for supporting the animal and for restraining the front legs, rear legs and head of the animal, each said supporting device being capable of being transported from an animal loading station to a treatment or manipulation station, means at said manipulation station for engaging and manipulating said supporting and restraining means to facilitate treatment of the animal, whereupon the supporting device may be transported with the animal restrained thereon to an unloading station.

4,892,063

LEASH FOR TWO OR MORE ANIMALS

Catherine M. Garrigan, 6111 Greeley Blvd., Springfield, Va. 22152

Continuation of Ser. No. 556,125, Nov. 29, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,643

Int. Cl.[4] A01K *27/00*

U.S. Cl. 119—109 **8 Claims**

1. A leash for a pair of animals comprising:

an elongated leash member having a first end and an opposite second end,

a first releasable animal fastening means secured to said first end for fastening said first end to a first animal,

a second releasable animal fastening means secured to said second end for fastening said second end to a second animal at the same time as said first end is fastened to the first animal, and

a slidable compressible handle positioned between and slidable on said leash member toward and away from said first and second releasable animal fastening means, and having an opening passing therethrough through which said leash member passes,

said slidable compressible handle being compressible between a first generally natural state where, when the user grasps said handle loosely, said handle slides freely between generally said first and second ends as the first and second animals when secured, respectively, to said first and second releasably fastening means generally move relative to said handle or to each other, and a second compressed state wherein, when the user grasps said handle firmly, said handle grasps said leash member and said handle is thereby held on said leash member in a position generally fixed relative to said first and second ends.

4,892,064

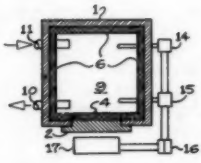
HEAT TRANSFER AND FLUID HEATING DEVICE

Joseph M. Zappia, 235 NW. 26 Ave., Miami, Fla. 33125

Division of Ser. No. 923,295, Oct. 27, 1986, Pat. No. 4,854,378. This application May 26, 1989, Ser. No. 357,164

Int. Cl.[4] F22B *5/00*

U.S. Cl. 122—366 **5 Claims**



1. Tank means for heating a liquid comprising:

(A) a container comprising walls of low heat conductivity,

(B) an opening through said walls at the bottom of said container,

(C) a high-heat-conductivity plate sealing said opening,

(D) fibrous blanket means covering said plate within said container,

(E) fibrous wick means within said container extending upwardly from said bottom substantially to the top thereof,

(F) first pipe means introducing cold liquid into said container,

(G) second pipe means removing relatively hot liquid from said container, and

(H) means heating said plate.

4,892,065

METHOD CONCERNING THE DELIVERY OF FUEL INTO THE COMBUSTION CHAMBER OF A DIESEL ENGINE AND A DEVICE FOR REALIZING THE METHOD

Hans List, Heinrichstrasse 126, A-8010 Graz, Austria, assignor to AVL Gesellschaft Für Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof. Dr.Dr.H.C. Hans List, Graz, Austria

Division of Ser. No. 96,782, Sep. 14, 1987, Pat. No. 4,846,114, which is a continuation of Ser. No. 778,069, Sep. 20, 1985, abandoned. This application May 25, 1989, Ser. No. 357,895

Int. Cl.[4] F02B *13/02*

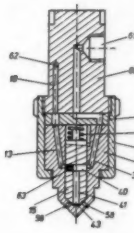
U.S. Cl. 123—26 **3 Claims**

1. An apparatus for sequentially injecting charges of fuel and compressed air into a combustion chamber of a diesel engine, said apparatus comprising

a nozzle body which has a first end and a second end and which can be connected to a cylinder head of a diesel engine such that its second end communicates with a

combustion chamber in said cylinder head, said nozzle body including a central bore which extends from said first end towards said second end, a plurality of nozzle bores at its second end which extend between said central bore therein and an outer surface thereof, and first and second separate feeder bores which communicate with said central bore, said first feeder bore carrying compressed air and said second feeder bore carrying fuel,

a fuel needle positioned in said central bore, said fuel needle including a cross bore which communicates with both said first and second feeder bores in said nozzle body and an



axial bore which extends from said cross bore to an end thereof adjacent said nozzle bores, and

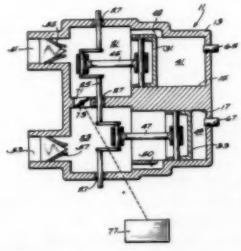
control means in said cross bore of said fuel needle for controlling whether the central axial bore in said fuel needle is in communication with said first feeder bore or said second feeder bore based on the relative pressures of compressed air in said first feeder bore and fuel in said second feeder bore, passage of a charge of compressed air through said axial bore in said fuel needle and then through said nozzle bores causing fuel remaining therein to be conveyed into said combustion chamber.

4,892,066

MULTI-CYLINDER TWO-STROKE ENGINE WITH REDUCED COST AND COMPLEXITY

Peter W. Brown, Hartland, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 19, 1987, Ser. No. 123,357
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 V **14 Claims**



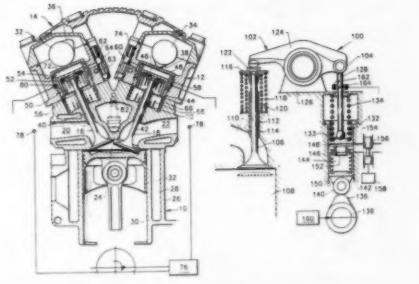
1. An internal combustion engine comprising first and second cylinders, first and second crankcases extending respectively from said first and second cylinders, a crankshaft extending through said first and second crankcases, first and second pistons connected to said crankshaft to afford opposite action of said pistons and respectively reciprocally movable in said first and second cylinders to define first and second combustion chambers respectively communicable, subject to piston movement, with said first and second crankcases, first and second means respectively including first and second reed valves for respectively supplying air to said first and second combustion chambers, a duct extending between said first and second crankcases, and a valve located in said duct and movable between open and closed positions to respectively permit and prevent fluid flow in both directions between said first and second crankcases.

4,892,067

VALVE CONTROL SYSTEM FOR ENGINES

Marius A. Paul; Ana Paul, and Cristiana J. Rotkoski, all of 1100 E. Orangethorpe Ave., Ste. 140, Anaheim, Calif. 92801

Filed Jul. 25, 1988, Ser. No. 223,436
Int. Cl.[4] F01L *9/02, 1/34*
U.S. Cl. 123—90.12 **16 Claims**



1. In an internal combustion engine having at least one cylinder with a piston reciprocal therein, and a cylinder head with first and second intake passages and first and second exhaust passages, each intake passage having an intake valve and each exhaust passage having an exhaust valve forming a four-valve per cylinder valve assembly, and, a cam shaft with cams dedicated to operate each intake valve and each exhaust valve in the valve assembly, an improved means for regulating the air charge and combustion gas emission to and from the engine cylinder comprising:

an electro-hydraulic valve lifter assembly for each valve, each lifter assembly including a first contact member mechanically contacting a cam on the cam shaft; a second contact member mechanically contacting a valve, wherein the first and second contact members are separated by a hydraulic chamber filled with hydraulic fluid and are displaceable with respect to one another in accord with the volume of fluid in the hydraulic chamber; valve means to regulate the flow of hydraulic fluid to and from the hydraulic chamber; and, electronic control means for operating each valve lifter assembly independently and controlling the regulation of hydraulic fluid to and from the hydraulic chamber according to engine conditions and operator demand wherein each valve in connection with an electro-hydraulic valve lifter assembly has a period and displacement controlled by the electronic control means wherein the first intake passage has a flow control means for restricting backflow and the second intake passage has fuel injection means for injecting fuel into the intake passage under time control of the electronic control means and wherein the electronic control means has a valve sequence timing regime under which the engine is operated in which the first intake valve in the first passage with at least one exhaust valve being open in part, such that exhaust gases are scavenged with air from the first intake passage without fuel loss.

4,892,068

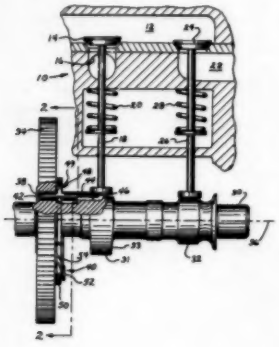
GEARED AUTOMATIC COMPRESSION RELEASE FOR AN INTERNAL COMBUSTION ENGINE

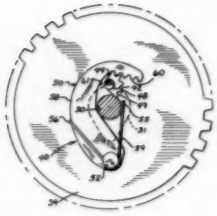
Jeffrey P. Coughlin, Kaukauna, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jun. 9, 1989, Ser. No. 364,745

Int. Cl.[4] F01L *13/08*

U.S. Cl. 123—182 9 Claims





1. In an internal combustion engine having a valve, a valve lifter, a cam shaft with a cam surface which engages the valve lifter to open the valve at a first angular position of the cam shaft, and a mechanism for opening the valve at a second angular position of the cam shaft, the improvement in the mechanism comprising:

a cam pin located adjacent to the cam surface in a manner in which said cam pin can rotate on its longitudinal axis, and having a portion eccentric to the longitudinal axis which portion extends above the cam surface to engage the valve lifter and open the valve in a first rotational position and which portion in a second rotational position does not engage the valve lifter in a manner which opens the valve;

a drive member attached to said cam pin and having teeth in one surface thereof; and;

a flyweight which rotates with the cam shaft and having teeth meshed with the teeth of said drive member.

4,892,069

THERMALLY STRESSED COMPONENT

Fritz Rösch, Schwabach, and Bernd Otte, Zirndorf, both of Fed. Rep. of Germany, assignors to Alcan International Ltd., Montreal, Canada

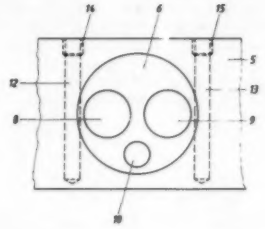
Filed Jul. 28, 1988, Ser. No. 225,455

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3726027

Int. Cl.[4] F02F *3/02*

U.S. Cl. 123—193 CH 15 Claims

1. Component for engines, machines or other devices subject to zonally differential thermal stress comprising at least one hollow chamber defined by the component outside and adjacent to zones of thermal stress which chamber is completely



filled with a substance which has a higher coefficient of thermal expansion than material of the component surrounding the hollow chamber.

4,892,070

TECHNIQUE AND SPARK PLUG TO IGNITE VERY LEAN FUEL AIR MIXTURES, PARTICULARY FOR GAS ENGINES

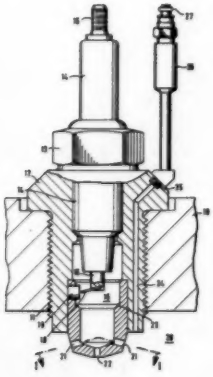
Dieter Kuhnert, Friedrich-Metz-Str. 18, 6920 Sinsheim, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,123

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3709976

Int. Cl.[4] F02B *19/08, 23/00*

U.S. Cl. 123—274 6 Claims



1. A spark plug construction for use in an opening of a combustion cylinder defining a main combustion chamber comprising: a connecting electrode; an insulating body surrounding said connecting electrode; a housing connected to said insulating body and surrounding said insulating body; an ignition chamber housing connected to said housing defining an ignition chamber, said connecting electrode having an end extending into said ignition chamber, said ignition chamber housing defining transfer channels providing fluid communication between the main combustion chamber and said ignition chamber; an ignition electrode connected to said connecting electrode, said ignition electrode being positioned in said ignition chamber; a counter electrode connected to said ignition chamber housing, said counter electrode cooperating with said ignition electrode to form a spark gap between said ignition electrode and said counter electrode; admixture line means

defined by said housing for providing an admixture from outside the cylinder to one of a space in said main combustion chamber adjacent one of said transfer channels and directly to one of said transfer channels intermediate said ignition chamber and the main combustion chamber, said admixture line means having at least one valve, said valve includes control means for opening and closing said valve in response to the pressure of the admixture in said admixture line means and in response to the pressure in said main combustion chamber, said valve is positioned at an outlet of said admixture line means adjacent said combustion chamber.

4,892,071

THROTTLE VALVE CONTROLLING APPARATUS EMPLOYING ELECTRICALLY CONTROLLED ACTUATOR

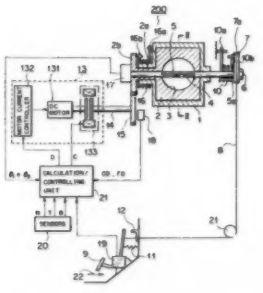
Yoshiaki Asayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,972

Claims priority, application Japan, Jul. 22, 1987, 62-184169; Sep. 11, 1987, 62-229214

Int. Cl.[4] F02D *9/08*

U.S. Cl. 123—336 **9 Claims**



1. A throttle valve controlling apparatus for an automobile comprising:

throttle valve means including a first throttle valve and a second throttle valve relatively rotatable to said first throttle valve, for controlling a flow of an air/fuel mixture to an engine;

rotating means mechanically coupled to an accelerator pedal, for relatively rotating said first throttle valve with respect to said second throttle valve;

first return spring means for biasing said first throttle valve so as to set the same to a first closed position of said throttle valve means when said accelerator pedal is released;

relative rotation angle sensor means for detecting an actual relative rotation angle between said first and second throttle valves to output an actual relative rotation angle signal;

calculation controlling means for producing a rotation command signal representative of a target relative rotation angle for said first and second throttle valves, determined by operation of said accelerator pedal;

electrically controlled actuator means for relatively rotating said second throttle valve with respect to said first throttle valve in response to said rotation command signal derived from said calculation controlling means in such a manner that deviation between said target relative rotation angle and actual relative rotation angle becomes zero;

rotation angle sensor means coupled to said second throttle valve, for detecting a rotation angle of said second throttle valve to output a rotation angle signal to said calculation controlling means; and,

second return spring means for biasing said second throttle valve so as to set the same to a second closed position of said throttle valve means, whereby when said electrically controlled actuator means is brought into malfunction by checking said rotation angle signal from said rotation angle means, said second throttle valve is set to said second closed position at which engine speed is rapidly reduced, and said first throttle valve is independently rotatable by said accelerator pedal.

4,892,072

SYSTEM FOR MEASURING AMOUNT OF AIR INTRODUCED INTO COMBUSTION CHAMBER OF INTERNAL COMBUSTION ENGINE WITH AVOIDING INFLUENCE OF TEMPERATURE DEPENDENT AIR DENSITY VARIATION AND PULSATILE AIR FLOW

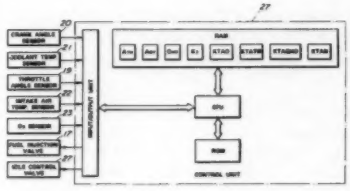
Hiromichi Miwa; Hatsuo Nagaishi; Ichirou Kishiki, all of Kanagawa, and Hirokimi Koyama, Shizuoka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 19, 1988, Ser. No. 195,975

Claims priority, application Japan, May 19, 1987, 62-121496

Int. Cl.[4] F02D *41/14*; F02M *3/00*

U.S. Cl. 123—340 **29 Claims**



1. A system for detecting intake air flow amount in an internal combustion engine, comprising:

a first means for monitoring an engine revolution speed to produce an engine speed indicative first signal;

a second means for driving a basic engine load indicative data on the basis of a path area of an air induction passage of said internal combustion engine and said first signal value, said second means producing a second signal indicative of said basic engine load;

a third means for deriving a delay factor for introducing intake air into anengine cylinder on the basis of said first and secondsignal values, and

a time dependent firs correction value for correcting said basic engine load indicative data on the basis of said delay factor; and

a fourth means for modifying said second signal value on the basis of said first correction value and outputting a modified second signal as said intake air amount indicative signal indicative of the intake air amount.

4,892,073

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noboru Yamamoto, Kariya; Masakuni Tsujimura, Anjo; Kiyotaka Sasaki, Nagoya; Kouichi Kato, Kuwana; Hideji Tani, Anjo; Yasuo Ito, Nagoya; Takeshi Matsui, Toyohashi, and Kenji Hashimoto, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 7, 1988, Ser. No. 241,216

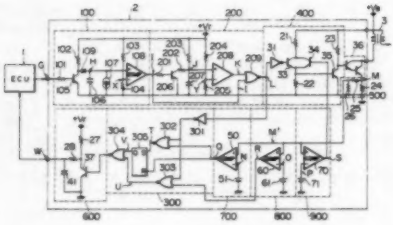
Claims priority, application Japan, Sep. 10, 1987, 62-226990

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—417 **14 Claims**

1. An ignition system for internal combustion engines comprising an electronic control unit for computing an ignition timing electronically in accordance with parameters of an internal combustion engine, computing an energization time of an ignition coil and producing a pulse-shaped ignition signal in accordance with a result of the computation, and ignition

circuit means for interrupting a primary current of the ignition coil on the basis of the ignition signal supplied from said electronic control unit and producing an ignition monitor signal, wherein said ignition circuit means includes set means for setting the ignition monitor signal at a timing of starting energization of the ignition coil, first reset means for resetting the ignition monitor signal when the primary current of the ignition coil has exceeded a first reference level and has reached a



second reference level higher than the first reference level, second reset means for resetting the ignition monitor signal when the primary current of the ignition coil is interrupted before the primary current reaches the second reference level after the primary current has exceeded the first reference level, and maintenance means for maintaining a preceding state without resetting the ignition monitor signal when the primary current does not reach the first reference level.

4,892,074

SPARK IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

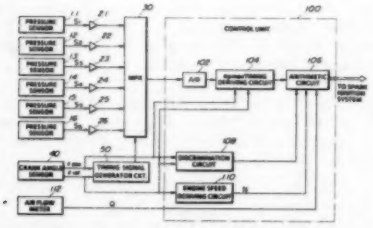
Masahiro Iriyama, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 28, 1988, Ser. No. 212,489

Claims priority, application Japan, Jun. 29, 1987, 62-100743[U]

Int. Cl.[4] F02P *5/12*

U.S. Cl. 123—425 **11 Claims**



1. A spark ignition timing control system for an internal combustion engine having a plurality of engine cylinders, comprising:

a first sensor for monitoring an engine revolution speed to produce an engine speed indicative first sensor signal;

a second sensor for monitoring load condition on the engine to produce an engine load indicative second sensor signal;

a third sensor, disposed in a first engine cylinder, for detecting first maximum pressure timing at which the internal pressure in a first combustion chamber thereof is obtained, said third sensor producing a third sensor signal indicative of said first maximum pressure timing;

a fourth sensor, disposed in a second engine cylinder, for detecting a second maximum pressure timing at which the internal pressure in a second combustion chamber thereof is obtained, said fourth sensor producing a fourth sensor signal indicative of said second maximum pressure timing;

fifth means for deriving a basic spark advance on the basis of said first and second sensor signal values;

sixth means for deriving a first error data representative of a difference between said first maximum pressure timing and a predetermined reference timing and a second error data representative of a difference between said second maximum pressure timing and said reference timing;

seventh means for deriving a correction value for said basic spark advance of said first engine cylinder, said correction value being constituted of a first component derived on the basis of said first error value and a second component derived on the basis of said second error value, and said seventh means correcting said basic spark advance of said first engine cylinder with said correction value.

4,892,075

CRANK ANGLE DETECTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

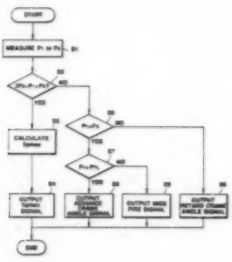
Masahiro Iriyama, and Hiroshi Satoh, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Nov. 1, 1988, Ser. No. 265,819

Claims priority, application Japan, Nov. 2, 1987, 62-166794[U]; Nov. 2, 1987, 62-166795[U]

Int. Cl.[4] F02P *5/15;* **G01M** *15/00*

U.S. Cl. 123—425 **27 Claims**



1. A system for detecting a maximum pressure crank angle at which the pressure within a firing cylinder of an internal combustion engine is maximum and whereby detecting offset of said maximum pressure crank angle from a predetermined target angle, comprising:

first means for monitoring engine crank angle to produce first signals indicative of first, second and third crank angles within a range defined in the vicinity of said target angle;

second means for monitoring engine crank angle to produce a second signal indicative of a fourth crank angle outside of said range;

third means for monitoring pressure in said firing cylinder, said third means being responsive to said first and second signals, for producing a pressure value indicative of pressure within said firing cylinder at said first, second, third, and fourth crank angles;

fourth means, for comparing said pressure values at said first, second, and third crank angles, for projecting said maximum pressure crank angle when said maximum pressure crank angle is included within said range; and

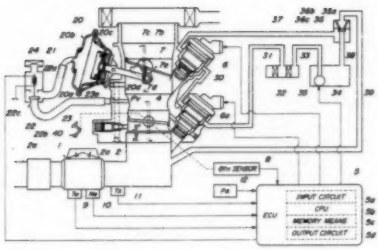
fifth means for deriving direction and magnitude of offset of said maximum pressure crank angle to said target angle based on said pressure values at said first, second, third, and forth angles when said maximum pressure crank angle is not included within said range.

4,892,076

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazushige Toshimits; Keiichi Osawa; Tadashi Umeda, and Kunio Noguchi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,330
Claims priority, application Japan, Sep. 8, 1987, 62-224807
Int. Cl.[4] F02D *41/00*
U.S. Cl. 123—442 19 Claims



1. A fuel supply control system for an internal combustion engine having a plurality of cylinders, an intake manifold formed by a diversified portion connected to each of said cylinders and a united portion to which said diversified portion is joined, a throttle body arranged within said united portion of said intake manifold, and a throttle valve provided within said throttle body said fuel supply control system comprising: a fuel injection valve arranged in said united portion of said intake manifold at a location upstream of said throttle body and having a nozzle for supplying fuel to said cylinders; an air throttle valve arranged in said united portion of said intake manifold at a location upstream of said throttle body, said air throttle valve having a valve body having a notched opening formed therein and disposed to be opposite said nozzle of said fuel injection valve to increase the flow speed of intake air in the vicinity of said nozzle when said air throttle valve is fully closed; first valve control means for controlling said fuel injection valve in response to operating conditions of said engine; second valve control mean for causing said air throttle valve to be fully closed when a predetermined low rotational-speed operating condition of said engine, in which at least the rotational speed of said engine is lower than a predetermined value, is satisfied; and means for setting said predetermined value of the rotational speed of said engine such that the lower the atmospheric pressure the smaller said predetermined value.

4,892,077

FUEL INJECTION CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Masahiko Yakuwa, Wako; Kikuo Tomozawa, and Kazuya Kishi, both of Minato, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

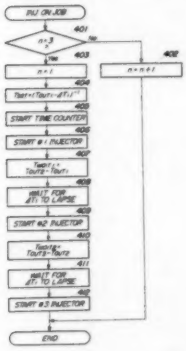
Filed May 12, 1988, Ser. No. 193,419
Claims priority, application Japan, May 12, 1987, 62-115539
Int. Cl.[4] F02D *41/20*
U.S. Cl. 123—487 7 Claims

1. A fuel injection control method for an internal combustion engine having a plurality of cylinders, and a plurality of fuel injection valves associated, respectively, with said cylinders, wherein fuel injection is started through each of said fuel injection valves while a period of time elapsed from the start of fuel injection is counted by time counting means, and the fuel injection through each of said fuel injection valves is terminated in response to completion of counting of said time counting means, the method comprising the steps of:

(1) starting fuel injection through a first one of said fuel injection valves, and at the same time causing said time counting means to count a period of time elapsed from the start of fuel injection through said first one fuel injection valve;

(2) starting fuel injection through a second one of said fuel injection valves when a predetermined period of time elapses after the start of fuel injection through said first one fuel injection valve;

(3) terminating the fuel injection through said first one fuel injection valve in response to completion of counting of



said time counting means started in said step (1), and at the same time setting a difference between a desired fuel injection period of time for said first one fuel injection valve and a desired fuel injection period of time for said second one fuel injection valve and restarting said time counting means to count said difference; and

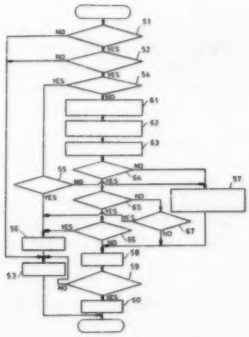
(4) terminating the fuel injection through said second one fuel injection valve in response to completion of counting of said time counting means restarted in said step (3).

4,892,078

FUEL SUPPLY QUANTITY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINE

Yoji Fukutomi; Takeshi Fukuzawa, both of Utsunomiya, and Keisuke Kudo, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,002
Claims priority, application Japan, Sep. 8, 1987, 62-224967
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—489 3 Claims



1. In a method of controlling a fuel supply quantity with use

of a fuel supply device in an internal combustion engine having an exhaust gas component concentration sensor for generating an exhaust gas component signal, the improvement comprising the steps of

(a) setting the fuel supply quantity according to engine operation parameters including said exhaust gas component signal so far as a preset fuel supply quantity is not grater than a reference quantity;

(b) setting the fuel supply quantity irrespective of said exhaust gas component signal when said preset fuel supply quantity continues to be greater than said reference quantity for at least a reference time; and

(c) changing said reference time according to engine temperature.

4,892,079

MAGNETOGENERATOR

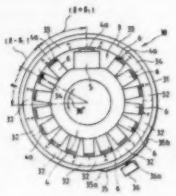
Kazuhisa Umezu, and Masayuki Ozawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,988

Claims priority, application Japan, Jun. 17, 1987, 62-151656; Jun. 17, 1987, 62-93610[U]; Jun. 18, 1987, 62-151728; Jun. 18, 1987, 62-93635[U]

Int. Cl.[4] F02P *3/06*; H02K *21/22*

U.S. Cl. 123—602 **6 Claims**



1. A magnetogenerator comprising a bowl shaped fly-wheel adapted to be rotated in synchronism with a rotation of an engine having an associated ignition circuit, a plurality of permanent magnets arranged orderly on an inner periphery of said fly-wheel with magnetic poles thereof being alternative, a plurality of power generating coils including an ignition power generating coil and arranged within said fly-wheel in opposing relation to said plurality of permanent magnets and a trigger pole of an angle position detector provided on a member rotatable in synchronism with the engine rotation for producing a reference signal for an ignition timing control at a predetermined crank position of the engine, said plurality of permanent magnets including a plurality of adjacently disposed first magnets (32) each having a first peripheral length l, a pair of adjacently disposed second magnets (33) disposed adjacent said first magnets peripherally of said fly-wheel and having a second peripheral length longer than said first length by l_1 and a pair of third magnets (34) disposed adjacent said second magnets, respectively peripherally, and having a third length shorter than said first length by l_1, a position and a peripheral length of said trigger pole being determined such that opposite ends of said trigger pole pass over an electromagnetic pick-up of said angle position detector when a polarity of an output voltage of said ignition power generating coil produced by crossing magnetic flux of second magnets is changed.

4,892,080

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

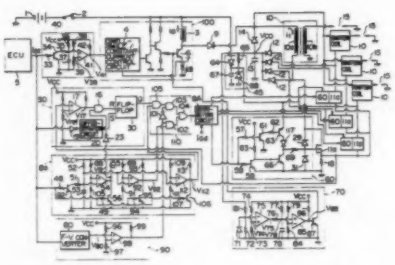
Seiji Morino, Okazaki; Satoru Kawamoto, Anjo; Yoshihiro Yoshitani, Nagoya; Toshio Sugimoto, Okazaki, and Toshio Nariki, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 1, 1988, Ser. No. 214,443

Claims priority, application Japan, Jul. 3, 1987, 62-167419; Nov. 30, 1987, 62-302968

Int. Cl.[4] F02P *3/06*

U.S. Cl. 123—604 **25 Claims**



1. An ignition system for an internal combustion engine, comprising:

a first series closed-loop circuit including a series connection of a DC power supply, an energy storage coil coupled to the DC power supply, and a first switching device coupled to the energy storage coil;

a second series closed-loop circuit coupled to the energy storage coil, including a series connection of a first diode, the primary winding of an ignition coil coupled to the diode, and a second switching device coupled to the primary winding;

a capacitor, connected to the energy storage coil through the diode; and

switching device control means for:

(1) first turning on a selected one of the first and second switching devices to store energy in the energy storage coil,

(2) subsequently turning off the selected one switching device to charge the capacitor using the energy stored in the energy storage coil,

(3) turning on the first switching device, after the charging the capacitor step, to store energy in the energy coil from the DC power supply,

(4) subsequently turning on the second switching device at substantially at the same time as a time of turning off of the first switching device and at an ignition timing, thereby to supply the primary winding of the ignition coil with both the energy stored in the energy storage coil and the energy charged in the capacitor.

4,892,081

COMPRESSIBLE BALL LAUNCHER

Randall H. Moormann, Georgetown, Mass., assignor to Tonka Corporation, Minnetonka, Minn.

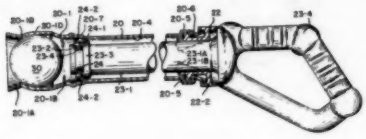
Filed Nov. 9, 1988, Ser. No. 269,255

Int. Cl.[4] F41B *11/00*

U.S. Cl. 124—65 **2 Claims**

1. A method of launching a compressible closed cell foam ball which will spring back to substantially its original shape after compression comprising forcing said compressible closed cell foam ball which will spring back to substantially its original shape after compression past a rigid constriction of a barrel into a ball retaining cavity thereof large enough to hold only a

single ball, moving a plunger positioned in the barrel to pull the ball a predetermined distance in the same direction as the motion of the plunger to cause air to rush into the barrel between the ball and the plunger and thereafter moving the



plunger in the opposite direction to force air in the barrel between said compressible ball and the plunger forming a seal between the ball and the constriction and thereafter causing the ball to compress and squeeze by the rigid barrel constriction thus launching said ball therefrom.

4,892,082

DRESSING ROLL AND METHOD FOR PRODUCING THE SAME

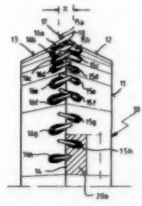
Horst J. Wedeniwski, Remshalden-Grunbach, Fed. Rep. of Germany, assignor to Fortuna-Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 288,016

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743813; Apr. 8, 1988, 3811783

Int. Cl.[4] B24B *53/00*

U.S. Cl. 125—11 R **6 Claims**



1. A dressing roll for dressing grinding wheels comprising a rotational roll body having a circumferential surface and an axis of rotation, said roll body defining a radial plane, extending perpendicularly to said axis, said dressing roll further comprising a plurality of diamond crystals being shaped as needles with a longitudinal axis, said needles being embedded into said surface over part of said longitudinal axis such that free ends of said needles protrude from said surface, said needles being, further, inclined with respect to said radial plane with a first number of needles being inclined in one direction and a second number of needles being inclined in a second direction opposite to said first direction, said first and second number of needles being arraned on said circumferential surface such that said free ends of said first number of needles overlap said free ends of said second number of needles when viewed in a circumferential direction.

4,892,083

BAKING OVEN

Helmut König, Rotmoosweg 15, A-8045 Graz, Austria

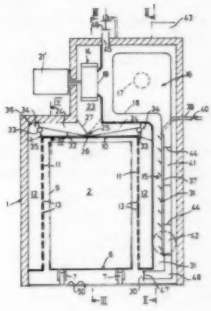
PCT No. PCT/AT87/00027, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO87/06100, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 15, 1987, Ser. No. 286,957

Claims priority, application Austria, Apr. 18, 1986, 1037/86

Int. Cl.[4] F24C *15/32*

U.S. Cl. 126—21 R **14 Claims**



1. A baking oven comprising a housing having a baking chamber, first and second side air channels, and a hot air channel therein, a cover wall having an upper and lower sides, a lower side of said cover wall defining and substantially closing the upper extremity of said baking chamber, first and second side partitions in said housing defining opposite sides of said baking chamber, said first and second side partitions substantially separating said first and second side air channels, respectively, from said baking chamber and each having a plurality of air openings therein, said side partitions extending upwardly to said cover wall, carriage means removably received in said baking chamber for supporting goods to be baked therein, blower means disposed at least partially above said baking chamber and directly connected to said hot air channel, said blower means being operative for withdrawing air from said baking chamber and blowing it directly into said blower hot air channel, heater means disposed at least partially above said baking chamber and operative for heating the air withdrawn from said baking chamber before it enters said blower means, means for humidifying the air withdrawn from said baking chamber, said hot air channel extending across the upper side of said cover wall and communicating with said side air channels, switch means disposed in a central portion of said hot air channel above the upper said of the central portion of said cover wall for directing air from said blower means so that it alternatively passes into said baking chamber through said first side air channel or through said second side air channel.

4,892,084

SPACE HEATING APPLIANCE

John E. Fletcher, Clifton-on-Teme, England, assignor to Ambi-Rad Limited, Great Britain

Filed Nov. 8, 1988, Ser. No. 268,582

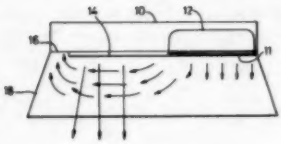
Claims priority, application United Kingdom, Nov. 10, 1987, 8726277

Int. Cl.[4] F24C *3/04*

U.S. Cl. 126—92 AC **10 Claims**

1. A radiant plaque heater comprising a casing, fluid fuel feeding means in said casing, combustion panel means in said casing and in communication with said fuel feeding means, said combustion panel means being adapted to receive fluid fuel therethrough for combustion at the face thereof and emission of radiant heat therefrom, combustion gas flue means in said

casing and arranged to receive combustion products from said face of said combustion panel means and exhaust said products from said heater, and secondary emitter panel means in said casing between said combustion panel means and said flue



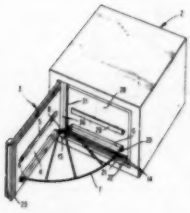
means and presenting an exposed face which is in the path of flow of said products, whereby said exposed face is heated by said products resulting in radiant heat being emitted from said secondary panel means to supplement the radiant heat emitted from said combustion panel means.

4,892,085

OVEN CLOSURES

Francisco J. Salvi, Zavirín 2040, Buenos Aires, Argentina

Filed Oct. 27, 1987, Ser. No. 113,124
Claims priority, application Argentina, Oct. 27, 1987, 305.701
Int. Cl.[4] F24C *15/16*
U.S. Cl. 126—340 **10 Claims**



1. An oven, comprising:

a plurality of upright walls defining an inner chamber, a first of the walls defining a front wall provided with an opening through which access may be had to the inner chamber, the opening including a first vertical axle extending along one side thereof, a second of the walls extending rearwardly from the first wall;

a door pivotally supported along said first vertical axle to be movable between a first door position extending across the opening for closing the inner chamber and a second door position opening the inner chamber, the door having an inner door surface facing rearwardly and exposed to the inner chamber when the door is in the first door position; an inner plate pivotally supported along a second vertical axle parallel to the first vertical axle and located within the inner chamber,

the inner plate being movable between a first inner plate position adjacent the second wall of the oven and a second inner plate position adjacent the opening, the inner plate including a front surface facing the inner chamber when the inner plate is in the first inner plate position;

at least one rack adapted for supporting materials to be heated in the oven; and means for supporting the rack between the front surface of the inner plate and the inner door surface, so that the door and the inner plate move together with the rack when the door is moved forwardly from the first door position to the second door position and so that when the door is in the second door position the rack is located outside the inner chamber and the chamber is closed by the inner plate;

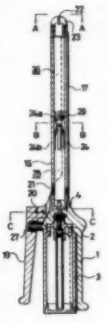
the second wall including a concavely curved surface disposed adjacent a junction between the first and second walls, the curved surface forming a recess for receiving the second vertical axis.

4,892,086

INTERNAL COMBUSTION TYPE IRON

Masaharu Ichikawa, 44-11, Matsubara 1-chome, Setagayaku, Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 293,751
Claims priority, application Japan, Jan. 11, 1988, 63-1824[U]
Int. Cl.[4] A45D *1/02*
U.S. Cl. 126—409 **4 Claims**



1. An internal-combustion type iron comprising:

a grip portion;

a liquified-gas tank attached to said grip portion;

a nozzle located in the grip portion in selective communication with said liquified-gas tank for jetting a gas supplied from the liquified-gas tank;

a hollow barrel having a base portion attached to said grip portion, the barrel interior communicating with this outflow of said nozzle;

an air hole provided in the base portion of the barrel allowing the inflow of outside air for forming a gaseous mixture of said air and said gas;

an exhaust port provided at a tip portion of the barrel;

a gas flow control body disposed within the hollow portion of said hollow barrel, comprising a stagnant vortex flow generator portion which is centered within said hollow portion, and perpendicular to the flow of the gaseous mixture for generating a stagnant vortex flow along a surface of the downstream side of said stagnant vortex flow generator portion wherein a flame commences at the stagnant vortex flow generator such that the gaseous mixture lies close to the barrel and thereby heats the barrel efficiently along the entire length thereof;

a mixing chamber located in the hollow portion of the barrel between said air hole and said gas flow control body, the mixing chamber having a length permitting the required mixing of said gas with said air and for stablization of flow velocity; and,

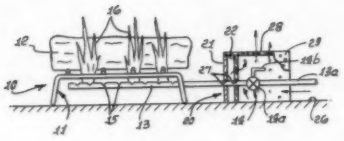
a heating chamber provided in the hollow portion of the barrel between said gas flow control body and said exhaust port, the heating chamber having a length sufficient for heating of the barrel by a combustion gas.

4,892,087

HEAT SHIELDING OF HOT FIREPLACES

Jon Bridgwater, Diamond Bar, Calif., assignor to R. H. Peterson Co., City of Industry, Calif.

Filed May 4, 1989, Ser. No. 346,878
Int. Cl.[4] F24C 3/00
U.S. Cl. 126—512 17 Claims



1. For combination with a hot fireplace that includes an elongated main gas burner associated with a grate for supporting logs, there being a control operatively connected with the burner to control flow of combustible gas to the burner, the control located near the fireplace,

(a) heat shield means located proximate the control to intercept infra-red radiation toward said control,

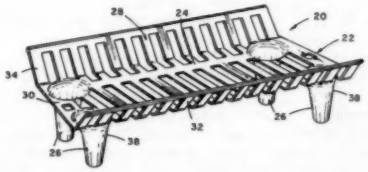
(b) said shield means having perforations sized for intercepting such radiation, and for passing convection air therethrough.

4,892,088

FIREPLACE GRATE

David M. Vestal, Sr., Sweetwater, Tenn., assignor to Vestal Manufacturing Company, Sweetwater, Tenn.

Filed Jun. 13, 1989, Ser. No. 365,370
Int. Cl.[4] F23H 13/00
U.S. Cl. 126—540 9 Claims



1. A fireplace grate comprising:

means defining a support surface upon which fireplace fuels are placed for burning; and

a plurality of legs for supporting said support surface-defining means above a floor of a fireplace, each of said legs having a body which is attached to said support surface-defining means;

said support surface defining an upwardly-opening recess extending downwardly into the body of each leg for nestingly receiving the leg of a grate of like construction placed in overlying relationship with said grate so that a plurality of grates of like construction can be stacked in a superposed relationship with the legs of each grate nestingly accepted by the recesses of an underlying grate;

said support surface including a section encircling the opening of each recess; and

each recess having sidewalls which extend downwardly into the body of a corresponding leg and which are joined to a corresponding opening-encircling section of said support surface along a smooth arcuate surface.

4,892,089

METHOD FOR COMMINUTING KIDNEY STONES

Franklin H. Cocks, and Scott R. Akers, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Feb. 23, 1989, Ser. No. 315,412
Int. Cl.[4] A61B 17/22
U.S. Cl. 128—24 A 12 Claims

1. A method for comminuting kidney stones with a lithotripter comprising:

exposing a stone to be comminuted to a renal matrix-attacking substance, said substance being a substance other than acid; and

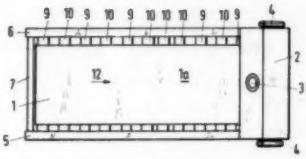
applying acoustic impulses to said stone; whereby the renal matrix-attacking substance lowers the fracture strength of the stone to be comminuted so that the stone is more easily pulverized by the acoustic impulses.

4,892,090

GUIDED RUNNING BELT OVER MASSAGE ROLLERS HAVING VARYING PROJECTIONS

Ernst Kaeser, Hauptstrasse 8, CH-4654 Lostorf, Switzerland

Filed Jul. 20, 1988, Ser. No. 221,799
Claims priority, application European Pat. Off., Jan. 27, 1988, 88101127.4
Int. Cl.[4] A61H 11/00, 15/00
U.S. Cl. 128—58 12 Claims



1. A massage appliance for foot reflex-zone massage, comprising:

a frame assembly having a running direction;

a plurality of elongated massage rollers arranged transversely of said running direction and mounted so as to be freely rotatable in said frame; each of said rollers having a cylindrical outer surface;

each of said massage rollers having a plurality of rounded ring shaped roller elevations extending radially therefrom;

said roller elevations being disposed about at least a part of the circumference of the cylinder outer surface of said massage rollers,

said elevations varying in radial height and in axial width;

said roller elevations of one massage roller being offset transversely relative to the roller elevations of adjacent massage rollers,

an endless running belt guided around the massage rollers to form a running surface; and

means for driving the running belt in the running direction transverse to the axes of rotation of the massage rollers.

4,892,091

SCRATCHING DEVICE

Don R. Sullenger, 15721 Blaine #B, Bellflower, Calif. 90706

Filed Sep. 26, 1988, Ser. No. 249,328
Int. Cl.[4] A61H 7/00
U.S. Cl. 128—62 R 2 Claims

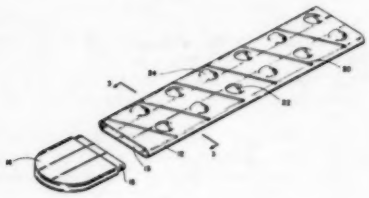
1. A scratching device, comprising:

an elongated body having two opposed generally flat rectangular faces, said body formed from a flexible material and having a hollow internal portion;

an open end at one end of said body communicating with said hollow interior portion;

a removable cap on said open end of said body;

a plurality of linear grooves spaced along the length of at least one of said faces of said body, said grooves each extending at an oblique angle with respect to a longitudinal axis of said body; and



a plurality of hollow hemispherical projections on at least one of said faces, said hemispherical projections each having an arcuate scraping edge and each communicating with said hollow interior portion.

4,892,092

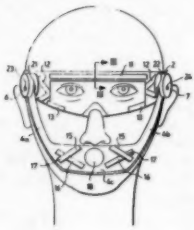
FACIAL MASK FOR USE IN EFFECTING ISOMETRIC TONING OF FACIAL MUSCLES

Sidi Klein, Hadganiot Street 6, Rehovot, Israel

Continuation-in-part of Ser. No. 826,796, Feb. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 566,033, Dec. 27, 1983, abandoned. This application Jul. 28, 1987, Ser. No. 78,633

Int. Cl.[4] A61F 5/08

U.S. Cl. 128—76 B 18 Claims



1. A facial mask for use in effecting isometric toning of facial muscles, comprising:

a plurality of shaped pressure applicators located to overlie the termination points of selected facial muscles of the user when applied to the user's head;

said facial mask including an upper band section having a plurality of said pressure applicators and configured to enclose the upper part of the uesr's head to overlie the user's eyes; and a depending lower section including a pair of arms joined at their outer ends to said upper band section at points outwardly of the eye portions and joined together at their inner ends forming an intermediate portion also having a plurality of pressure applicators to overlie the user's mouth;

a rear expansible chamber carried by the facial mask to overlie the back of the user's head such that when the chamber is expanded, it causes said pressure applicators to apply pressure to the termination points of the selected facial muscles;

and a hand-operated fluid pump for manually pumping fluid into said expansible chamber to expand it and thereby to cause said pressure applicators to apply pressure to the termination points of the selected facial muscles.

4,892,093

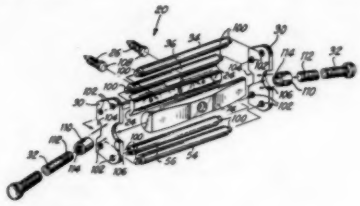
FEMORAL CUTTING GUIDE

Alfred J. Zarnowski, North Plainfield, N.J., and Christopher G. Sidebotham, Scotchtown, N.Y., assignors to Osteonics Corp., Allendale, N.J.

Filed Oct. 28, 1988, Ser. No. 263,687

Int. Cl.[4] A61F 5/04

U.S. Cl. 606—82 16 Claims



1. A cutting guide for guiding a saw blade during the preparation of a femur for the implant of a femoral knee prosthesis, said cutting guide enabling guiding of said saw blade for cutting an axially directed anterior femoral cut, an axially directed posterior femoral cut, an anterior chamfer and a posterior chamfer, while said cutting guide remains located and secured to the femur in a single position on a transverse surface located along the distal femur, said cutting guide comprising:

a base member;

locating and securing means on said base member for locating and securing said base member on the femur at said transverse surface;

opposite side members extending from said base member in an axial direction distally relative to said transverse surface;

a first set of guide members extending laterally between said side members and located to delineate transversely opposite boundaries of an axially directed anterior cutting path intercepting the anterior femur, said first set of guide members including opposite guide surfaces spaced apart axially along said anterior cutting path for guiding said saw blade along said anterior cutting path during the anterior femoral cut;

a second set of guide members spaced transversely from said first set of guide members, said second set of guide members extending laterally between said side members and located to delineate transversely opposite boundaries of an axially directed posterior cutting path intercepting the posterior femur, said second set of guide members including opposite guide surfaces spaced apart axially along said posterior cutting path for guiding said saw blade along said posterior cutting path during the posterior femoral cut; and

a further set of guide members located transversely between said first and second sets of guide members, said further guide members extending laterally between said side members and located for delineating transversely opposite boundaries of an oblique anterior chamfer cutting path and delineating transversely opposite boundaries of an oblique posterior chamfer cutting path, said further guide members including first opposite guide surfaces spaced apart along said oblique anterior chamfer cutting path for guiding said saw blade along said oblique anterior chamfer cutting path during the anterior chamfer cut and second apposite guide surfaces spaced apart along said oblique posterior chamfer cutting path for guiding said saw blade during the posterior chamfer cut;

said side members being spaced apart laterally a distance sufficient to provide each of said delineated anterior cutting path, posterior cutting path, anterior chamfer cutting path and posterior chamfer cutting path with a continuous, uninterrupted lateral extent corresponding to the full

lateral extent of the respective anterior femoral cut, posterior femoral cut, anterior chamfer and posterior chamfer, whereby the full anterior femoral cut, the full posterior femoral cut, the full anterior chamfer and the full posterior chamfer are accomplished while said cutting guide is located and secured on the femur in the single position on said transverse surface of the distal femur.

4,892,094

PRESSURE RESPONSIVE DIAPHRAGM VALVE

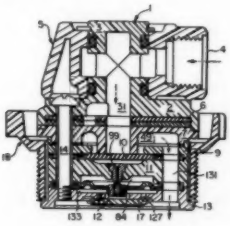
Nobuo Shigematsu, Urawa, Japan, assignor to Shigematsu Works Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,350

Claims priority, application Japan, Mar. 24, 1988, 63-38378[U]

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—201.28 6 Claims



1. A pressure responsive diaphragm valve comprising a valve assembly body and a pilot nozzle that is opened or closed by action of a pressure detecting diaphragm where said detecting diaphragm is operated in accordance with a pressure variation so as to move a diaphragm valve plate to an open or closed position, and wherein said valve assembly body excluding a mounting ring of said body consists of mutually laminated layer members.

4,892,095

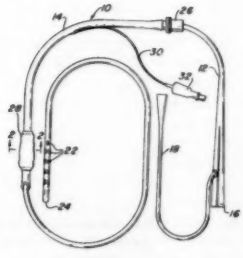
ENDOTRACHEAL TUBE

Karim B. Nakhgevany, 302 Fairview Rd., Narberth, Pa. 19072

Filed Mar. 17, 1987, Ser. No. 27,287

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.14 4 Claims



1. A method for endotracheal intubation comprising the steps of:

(a) providing a flexible guide tube having a length sufficiently long to extend between a patient's face and stomach and having a closed blunt end with at least one opening adjacent said closed end, said guide tube being adapted for passing a gas therethrough to said opening;

(b) inserting said guide tube through a facial passageway of the patient;

(c) blowing gas into said guide tube;

(d) auscultating over said patient's stomach;

(e) determining the location of said guide tube by listening for a gurgle-like sound, if said gurgle-like sound is made then said guide tube is removed and reinserted, if said gurgle like sound is not heard then said guide tube is properly located within said patient's trachea;

(f) sliding an endotracheal tube over said guide tube while a portion of said guide tube is positioned in said patient's trachea; and

(g) removing said guide tube from said patient.

4,892,096

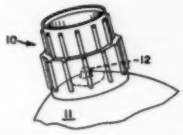
BREAST MARKING DEVICE

Krishna Narayanan, and Marc D. Liang, both of Pittsburgh, Pa., assignors to Montefiore Hospital Association of Western Pennsylvania, Pittsburgh, Pa.

Continuation of Ser. No. 57,117, Jun. 3, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 270,420

Int. Cl.[4] A61B *17/00*

U.S. Cl. 606—1 6 Claims



1. A device for creating a circular skin-discoloration mark on the surface of a human breast having an areola, said device comprising an optically transparent tubular member open at each end and having a generally circular cross section, one of the open ends of said tubular member having a greater diameter than the other open end; each of the two open ends comprising a circular marking edge; a wall member between the open ends extending across said tubular member substantially normal to the longitudinal central axis of said tubular member and being optically transparent; sighting means on said wall member comprising a pair of cross-markings intersecting at the central longitudinal axis of the said tubular member.

4,892,097

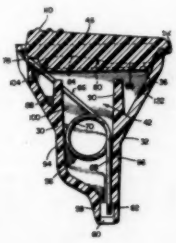
RETRACTABLE FINGER LANCET

Joseph V. Ranalletta, and Rowland W. Kanner, both of Guntersville, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Feb. 9, 1988, Ser. No. 153,968

Int. Cl.[4] A61B *17/32*

U.S. Cl. 606—182 9 Claims



1. A single-use, discardable lancet assembly including a lancet having a skin-puncturing probe and a housing in which

said lancet is mounted and confined, said housing having front and rear walls and side walls connected thereto and extending therebetween, said housing being formed with a through aperture in an end thereof for movement of a probe therethrough for piercing the skin, said skin-producing probe of said lancet being mounted within and reciprocably movable in said housing, said probe having a sharpened point for puncturing the skin upon being forcibly urged thereagainst, a releasably-restrained, pretensioned torsion spring means integral with said probe and operable upon release of restraint for driving said sharpened point of said probe through a travel sequence initiated from a stand-by, retracted, restrained, and inoperative position of said probe and continuing through a functional disposition of said probe in which said point of said probe forcibly pulses downwardly to project through said aperture and outwardly of said housing and then immediately returns to a final, retracted and sequestered state in which said point resides irretrievably interiorly of said housing, spring securement means in said housing for restrictingly securing, confining, and restraining said spring means in a tensioned, biased configuration and for establishing said retracted, stand-by position of said reciprocably movable probe of said lancet in said housing, and spring guide means in said housing for delineating a path of movement of said spring means upon release thereof, non-resettably trigger means for releasing said spring from said spring securement means for initiating said spring means travel sequence, and means securing said trigger means to said housing for access exteriorly thereof and wherein said spring means comprises an elongated wire disposed to extend longitudinally in said housing, said wire having opposed upwardly and downwardly directed lineal end portions joined to an integrally formed intermediately-positioned looped section, said sharpened point being formed on an end of said downwardly directed end portion, wherein movement of said spring means within said housing and transition of said spring means between initial and final states is effective temporarily to vary an overall operational length dimension of said spring and reciprocally to extend and to retract relative to said housing end aperture, said downwardly directed end portion of said spring means including said sharpened point of said probe.

4,892,098

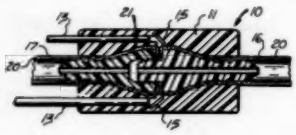
TUBULAR TISSUE WELDING DEVICE WITHOUT MOVING PARTS

Jude S. Sauer, 62½ Lattimore Rd., Rochester, N.Y. 14620

Continuation-in-part of Ser. No. 919,954, Oct. 17, 1986, abandoned, which is a division of Ser. No. 748,972, Jun. 26, 1985, Pat. No. 4,633,870. This application Feb. 25, 1988, Ser. No. 160,158

Int. Cl.[4] A61B *17/04, 17/36;* **B23K** *9/00*

U.S. Cl. 606—18 **4 Claims**



1. An exoscope for joining tubular like objects comprising:

a hand-manipulable housing having first and second sections selectively movable relative to each other to form an unitary housing with a central opening lengthwise through said housing,

means for releasably supporting a pair of generally cylindrically shaped sections in said central opening formed in said housing, and with confronting ends of sections abutting each other along a seam located within said central opening,

a plurality of flexible, light transmissive elements extending at one into fixed sites in both sections of said housing and disposed to be connected at their opposite end to a source of laser energy operable to direct a beam of laser energy through said transmissive element into said housing,

means in said housing for directing said laser beam emitted from said light transmissive element to said central opening and onto said seam, said beam directing means simultaneously directing said beam circumferentially around said central opening to all portions of said seam thereby welding together said abutting ends along said seam, said housing sections being movable away from each other at the conclusion of a welding operation, to thereby permit withdrawal of the housing from the welded cylindrical sections to disengage the later said two housing sections being all of the housing sections required for joining tubular like objects.

4,892,099

CATHETER

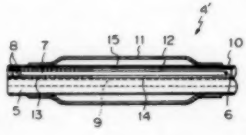
Shin-ichi Ohkawa; Koichi Tsuno; Jun-ichi Hiramoto, and Norifumi Matsumiya, all of Konohana, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 41,630, Apr. 22, 1987, abandoned, which is a continuation of Ser. No. 755,468, Jul. 16, 1985, abandoned. This application Dec. 12, 1988, Ser. No. 284,763

Claims priority, application Japan, Jul. 18, 1984, 59-107512[U]; Oct. 4, 1984, 59-208779

Int. Cl.[4] A61B *1/06;* **A61M** *29/02*

U.S. Cl. 606—194 **7 Claims**



1. A catheter for insertion into a blood vessel, comprising:

a flexible tube-like sheath having a fluid passage therein;

a radially expansive and contractive balloon disposed about the peripheral surface of the distal end portion of said sheath and communicating with said fluid passage;

a light guide for transmitting illumination light to the distal end of said catheter;

an image guide for transmitting an image from the distal end of said catheter; and

a transparent liquid guide having a flush opening at the distal end of said catheter;

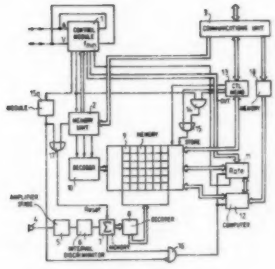
wherein said light guide, said image guide, and said transparent liquid guide are disposed substantially parallel with each other within said flexible tube-like sheath; and

wherein said light guide comprises a single transparent member formed by extrusion which substantially fills the inside of said flexible tube-like sheath along the entire length of said flexible tube-like sheath such that said image guide and said fluid passage and said transparent liquid guide are also formed with said light guide by extrusion of said single transparent member and disposed within said transparent member.

4,892,100
DEMAND PACEMAKER WITH PHYSIOLOGICAL CONTROL

Max Schaldach, Erlangen, Fed. Rep. of Germany, assignor to BIOTRONIK Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 832,003, Feb. 24, 1986, abandoned.
This application Aug. 3, 1988, Ser. No. 228,826
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506789
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 PG 14 Claims



1. A cardiac pacemaker for electrically stimulating the heart of a patient, comprising:

electrode means for applying stimulation pulses to the heart of the patient;

first monitoring means for detecting a physiological parameter which is characteristic of the patient and producing a first output signal representative of said first physiological parameter, said physiological parameter influencing spontaneous heart action in that the times between heart pulses spontaneously produced in the patient varies with variations in the value of said physiological parameter;

second monitoring means for monitoring the times between heart pulses spontaneously produced in the patient and producing a second output signal representative thereof;

memory means connected to said first and second monitoring means for storing representations based on said second output signal of the length of time between heart stimulation pulses spontaneously produced in the patient together with the concurrently occurring value of said physiological parameter;

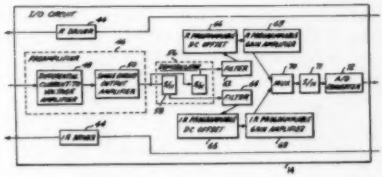
circuitry means for producing a first address signal to address said memory means as a function of said first output signal and for producing a third output signal corresponding to said length of time representation; and

stimulation pulse producing means connected between said circuitry means and said electrode means for supplying to said electrode means, at least during the absence of spontaneous heart action, heart stimulation pulses at time intervals corresponding to said length of time representation produced by said circuitry means for the presently existing value of said physiological parameter.

4,892,101
METHOD AND APPARATUS FOR OFFSETTING BASELINE PORTION OF OXIMETER SIGNAL

Peter W. Cheung, Mercer Island; Karl F. Gauglitz, Kirkland; Lee R. Mason, Issaquah; Stephen J. Prosser, Lynnwood; Robert E. Smith, Edmonds; Darrell O. Wagner, Monroe, and Scott W. Hunsaker, Seattle, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Continuation of Ser. No. 897,664, Aug. 18, 1986, Pat. No. 4,819,646. This application Feb. 24, 1989, Ser. No. 315,330
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[4] A61B 5/00, 6/00
U.S. Cl. 128—633 9 Claims



1. An apparatus for receiving and processing signals, produced by a sensor, that contain information about the oxygen saturation of arterial blood flowing in tissue, said apparatus comprising:

offset subtraction means for subtracting from said sensor signal a controlled portion of said signal, said offset subtraction means having an output that is substantially equal to the portion of said sensor signal remaining after said controlled portion is subtracted therefrom;

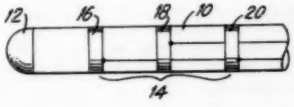
control means for receiving said output of said offset subtraction means and providing a subtraction control signal, which is dependent on said output, to said subtraction means to control the magnitude of said portion of said sensor signal; and

analyzing means for receiving said output of said subtraction means and said controlled portion of said signal and producing an indication of the oxygen saturation of said arterial blood flowing in said tissue.

4,892,102
CARDIAC PACING AND/OR SENSING LEAD AND METHOD OF USE

Eliezer A. Astrinsky, 2600-1-n Netherlands Ave., Riverdale, N.Y. 10463

Continuation of Ser. No. 858,567, Apr. 24, 1986, abandoned, which is a continuation of Ser. No. 647,975, Sep. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 600,511, Apr. 16, 1984, abandoned. This application Sep. 26, 1986, Ser. No. 912,236
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—642 14 Claims



13. A method for sensing electrical signals associated with muscular depolarization in a chamber of a heart without sensing electrical signals (a) associated with muscular depolarization in other chambers of the heart or (b) otherwise extraneous to the electrical signal being sensed, said method comprising the steps of:

providing sensing circuitry;

placing a sensor assembly, mounted on an endocardial lead and including three spaced apart ring electrodes connected to the sensing circuitry, into a heart chamber;

sensing, with the middle one of the three ring electrodes relative to the outer two electrodes placed in the one heart chamber, electrical signals associated with muscular depolarization in the one heart chamber,

connecting the two outer electrodes together and to the sensing circuitry connecting the middle ring electrode to the sensing circuitry;

rejecting with the equi-potential state of the two outer ring electrodes in the heart in the area of the middle ring electrode, electrical signals (a) associated with muscular depolarization in other chambers of the heart or (b) otherwise extraneous to the electrical signals being sensed, thereby to prevent such other electrical signals from being sensed by the middle ring electrode.

4,892,103

ULTRASONIC SCANNING PULSE-GENERATING APPARATUS

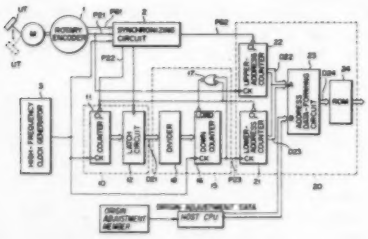
Tatsuo Ogasawara, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 188,146, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 925,922, Nov. 3, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,697

Claims priority, application Japan, Nov. 7, 1985, 60-250042

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—660.01 **7 Claims**



1. An apparatus for providing energizing pulses to an ultrasonic pulse transducer, comprising:

position-detecting means coupled to a rotating motor for swingably moving an ultrasonic transducer, for generating a predetermined number of rotation angle pulses every time the motor rotates 360 degrees;

pulse cycle-measuring means for measuring a one-cycle period (T) of the rotation angle pulses output from the position-detecting means;

pulse-generating means, including means for dividing the one-cycle period (T) by a predetermined integer (m), for generating a plurality of divided pulses corresponding to a value obtained by said dividing means;

counting means for counting the divided pulses output from the pulse-generating means, to output count data; and

scanning pulse-generating means for generating scanning pulses corresponding to the count data.

4,892,104

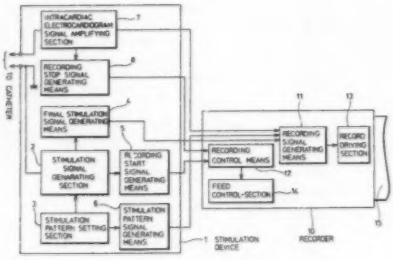
APPARATUS FOR INSPECTING AN ELECTRICALLY STIMULATED HEART

Meiichi Ito, Sendai; Kazuya Kuriyagawa, Miyagimachi; Hitoshi Adachi, Tokyo, and Kohei Ohno, Higashiyamato, all of Japan, assignors to Nihon Kohden Corp., Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 251,196

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—697 **5 Claims**



1. Apparatus for inspecting the electrical stimulation of a patient's heart, said apparatus including a stimulation means wherein an electrical stimulating wave is generated by an electrical stimulation wave generating means so to effect pacing of said heart in accordance with an externally set stimulating pattern impressed upon said wave and applied to said heart through a catheter, wherein intracardiac recorded on a recorder which is annexed to said stimulation means, said apparatus comprising:

(a) a final stimulation signal generating means for generating a final stimulation signal at a timing corresponding to a final electrical stimulation wave;

(b) a stimulation pattern generating means for generating a stimulation pattern representative of said stimulation pattern;

(c) a recording start signal generating means for generating a recording start signal for starting said recorder in advance of said generation of said final electrical stimulating wave;

(d) detecting said intracardiac electrocardiogram signal generated for the first time after said generation of said final electrical stimulation wave, and for generating a recording stop signal after the detection of said intracardiac electrocardiogram signal;

(e) a recording signal generating means for generating recording signals in accordance with which, the waveforms of said final stimulation signal and said intracardiac electrocardiogram signal are recorded, and the characters corresponding to said stimulation pattern are printed by said recorder; and

(f) a recording control means for starting the recording operation of said recorder in response to said recording start signal and stopping the recording operation in response to a said recording stop signal.

4,892,105

ELECTRICAL STIMULUS PROBE

Richard L. Prass, Lakewood, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Continuation of Ser. No. 845,848, Mar. 28, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,642

Int. Cl.[4] A61N *1/32*

U.S. Cl. 128—741 **14 Claims**

1. A hand held instrument for electrically stimulating exposed, subcutaneous tissue of a living body comprising:

an elongated, relatively flexible, electrically conductive wire

element including a handle end and a tissue engaging end having a planar surface generally transverse to the axis of said wire element, said wire having sufficient rigidity to generally resist bending when in operable contact with said exposed subcutaneous tissue;

a tube encasing said wire element and orienting said wire element along a predetermined path, wherein a predetermined portion of said wire element is external of said tube and is adjustable relative thereto;

handle means disposed on the handle end of said wire element for manipulating said instrument;

means for connecting said wire element to a source of electrical stimulation energy; and

a sheath electrically insulating the peripheral surface along the length of said wire element wherein only said planar surface at the tissue engaging end thereof transmits electrical stimulus to said tissue when said wire element is positioned thereagainst.

4,892,106

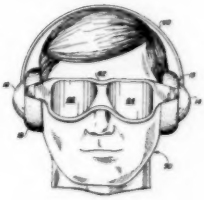
MULTIPLE AFFERENT SENSORY STIMULATION DEVICE

William J. Gleeson, III, 2319 W. Rapallo Way, Tucson, Ariz. 85741

Filed Oct. 19, 1987, Ser. No. 109,403

Int. Cl.[4] A61B *13/00*; A61N *1/00*; H05G *00/00*

U.S. Cl. 128—745 **11 Claims**



1. A multiple afferent sensory stimulation device providing audio and visual sensory stimulation to a patient comprising:

a playback device adapted to receive a pre-recorded program and to emit audio stimulation signals and a plurality of visual stimulation control signals;

means operably connected to said playback device to separate the visual stimulation control signals from the audio stimulation control signals, said means including a high pass filter to block the audio stimulation signals while passing the visual stimulation control signals;

means operably connected to said playback device to provide audio stimulation to at least one of the patient's ears;

a pair of tone decoders operably connected to said means separating the visual stimulation control signals from the audio stimulation signals, one of said tone decoders adapted to emit a signal output upon receipt of a visual stimulation control signal of a first frequency, and a second of said tone decoders adapted to emit a signal output upon receipt of a visual stimulation control signal of a second frequency;

a logic circuit connected to said pair of tone decoders adapted to receive signal outputs from said first and second tone decoders, said logic circuit adapted to ignore false signals from either said first or second tone decoders; and

means operably connected to said tone decoders to receive the decoded visual stimulation control signals for displaying visual stimulation to at least one of the patient's eyes whereby audio and visual stimulation is provided a patient in accordance with the pre-recorded program to induce sensory reactions into the patient.

4,892,107

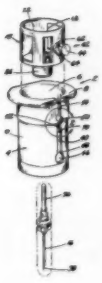
SINGLE USE, SAFETY BLOOD COLLECTION DEVICE

Terry M. Haber, El Toro, Calif., assignor to Habley Medical Technology Corp., Laguna Hills, Calif.

Filed Jan. 5, 1988, Ser. No. 141,019

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—763 **32 Claims**



1. A blood collection device comprising:

an outer sleeve and an inner needle carrier for receiving a double-pointed needle;

said inner needle carrier being mounted within said outer sleeve for axial movement between a first location at which said needle is adapted to project from said outer sleeve in an exposed position for drawing blood and a second location at which said needle is adapted to be fully disposed within said outer sleeve in a retracted position after use;

detent means cooperatively defined by the carrier and the outer sleeve for releasably holding said inner needle carrier in said first location for use of the needle;

locking means cooperatively defined by the carrier and the outer sleeve for non-releasably locking said inner needle carrier in said location after the use of said needle;

said outer sleeve including a slot and wherein said inner needle carrier includes an actuator extending through said slot for manually sliding said inner needle carrier from said first location to said second location; and

said inner carrier including means for resiliently biasing said actuator radially outwardly through said slot.

4,892,108

MULTI-CHANNEL EXTRACOCHLEAR IMPLANT

Josef M. Miller; Bryan E. Pfingst, both of Ann Arbor, Mich.; Anders Tjellstrom, Gothenburg, and Tomas Albrektsson, Molndal, both of Sweden, assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jul. 23, 1987, Ser. No. 76,882

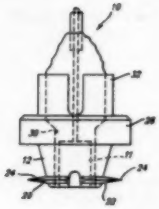
Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—784 **21 Claims**

1. An anchor device for anchoring at least one electrode in or adjacent to a human cochlea so that the at least one electrode can afford electrical stimulation of nerve fibers to produce the sensation of sound, said device comprising:

shaft means forming a shaft and adapted to be disposed in an aperture in the lateral wall of the inner ear;

barb means forming at least one barb about said shaft means for preventing removal of said shaft means from the aperture; and



aperture means forming at least one aperture communicating axially through said shaft means to allow the at least one electrode to be disposed within said shaft means;

wherein said barb means comprises an annular barb disposed about said shaft means near one end thereof.

4,892,109

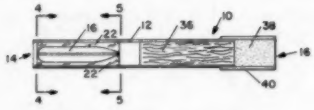
SIMULATED SMOKING ARTICLE

David G. Strubel, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 8, 1989, Ser. No. 320,428

Int. Cl.[4] A24F *1/00*; A24B *15/00*

U.S. Cl. 131—194 **7 Claims**



1. A simulated smoking article comprising:

a cylindrical sleeve open at its opposite ends and fabricated of a non-combustible material;

a capsule concentrically located within the sleeve extending from proximately one open end of the sleeve longitudinally of the sleeve a distance less than the length of the sleeve, the capsule having an outer circumference less than the inside circumference of the sleeve, and the capsule being fabricated of a heat conducting material;

a heat destructible seal located in the capsule dividing the interior of the capsule into a first chamber and a second chamber;

a fluid permeable membrane located in the capsule adjacent to and coextensive with the seal;

a first chemical reactant in the first chamber;

a second chemical reactant in the second chamber;

the first and second chemical reactants are selected from the group which reacts only exothermically, will not evolve a gas, and which are non-toxic individually and creates a non-toxic reaction product;

an annular air flow passage defined between the inside circumference of the sleeve and the outside circumference of the capsule;

a porous substrate located in the sleeve downstream of the capsule and air flow passage relative to the flow of air through the annular passage;

an aerosol generating substance in the substrate; and,

a filter located adjacent the porous substrate at the other open end of the sleeve opposite the capsule.

4,892,110

HAIR WRAP DEVICE

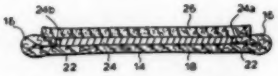
Philis A. Harvie, 227 Rhodes Avenue, Toronto, Ontario, Canada M41 3A2

Filed Jul. 18, 1988, Ser. No. 220,861

Claims priority, application Canada, Dec. 22, 1987, 555166

Int. Cl.[4] A45D *8/36*

U.S. Cl. 132—273 **9 Claims**



1. A hair wrap device for coiling about a bundle of hair to retain the hair in said bundle, comprising:

a thin, substantially rectangular sheet-like backing member having folded portions along at least two parallel sides thereof folded over onto a top surface of said backing member, a gap being formed on said top surface between edges of said folded over portions;

a rectangular, substantially flat, manually coilable, ductile metallic member, located in the gap, said ductile metallic member and said folded-over portions being of substantially equal thickness so that said folded-over portions and said ductile metallic member together form a substantially flat surface to which a thin, flexible, substantially rectangular decorative cover member is attached;

said cover member overlying at least a portion of each of said folded-over portions so as to bridge the gap along the length thereof and thereby sandwiching the metallic member between said top surface of said backing member and said cover member; and

said ductile metallic member possessing sufficient resistance to bending so that said hair wrap device when manually coiled about a bundle of human hair retains the hair in said bundle.

4,892,111

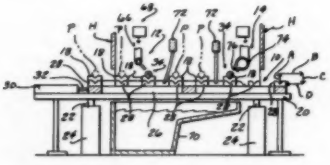
PRODUCTION LINE PART CLEANING APPARATUS

Harold W. Parslow, Jr., and Timothy M. Parslow, both of Mt. Clemens, Mich., assignors to GraPar Corporation, Warren, Mich.

Filed Jun. 22, 1987, Ser. No. 65,280

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—66 **4 Claims**



1. An apparatus for production line spraying of like parts, each part having an established axis of rotation, said apparatus comprising:

conveying means operable to advance shaft-like parts in succession in intermittent step-by-step movement along a fixed path by cyclically lifting a part above stationary cradle blocks, carrying said part downstream along said fixed path of movement, lowering said conveying means below said stationary cradle blocks, and returning said conveying means upstream along said fixed path of movement;

first and second stationary platforms fixedly mounted in

transverse alignment with each other at opposite sides of the conveying means and elevated above the stationary cradle blocks along the elevated downstream path of movement for said parts;

first and second carrier plates slidably mounted on the first and second stationary platforms respectively for horizontal movement toward and away from said parts;

first and second spindles rotatively supported by said first and second carrier plates respectively for rotation about a co-axial horizontal axis normal to the path of movement of the parts;

means for reciprocating the first and second carrier plates from a retracted position, wherein the first and second spindles are axially spaced from each other by a distance greater than an axial length of said parts, to an extended position, wherein the first and second spindles are co-axially engaging opposite ends of a part supported clear of the stationary cradle blocks at a downstream elevated first position;

part rotating means connected to one of the spindles for rapidly rotating said part by driving the spindle and engaged part in rotation about said co-axial horizontal axis when said first and second spindles are in the extended position coaxially aligned with the established axis of rotation for the part while the other of the spindles rotates freely; and

spray means adjacent said first location actuable to discharge pressurized cleaning fluid against said part while said part is being driven in rotation by said part rotating means.

4,892,112

HAND TOOL FOR CLEANING DISINFECTING AND/OR LUBRICATING

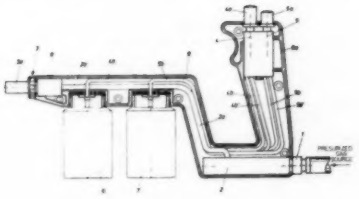
Wilfried Knetsch, Vienna, Austria, assignor to Ogussa Osterreichische Gold-und Silber Scheideanstalt Scheid und Roessler Gesellschaft M.b.H. & Co. KG, Vienna, Austria

Filed Aug. 5, 1988, Ser. No. 229,056

Claims priority, application Austria, Aug. 7, 1987, A2000/87

Int. Cl.[4] B08B *3/02, 9/00*

U.S. Cl. 134—102 **6 Claims**



1. A hand tool for cleaning, disinfecting, and/or lubricating dental tool holders, angle pieces, turbine pieces, or the like, said tool comprising:

(a) an inlet opening,

(b) a source of pressurized gas connected to said hand tool inlet opening,

(c) means for initiating and terminating the flow of said source of pressurized gas into said hand tool inlet opening,

(d) an outlet opening comprising means for mounting a dental tool holder, an angle piece, a turbine piece or the like thereon,

(e) a pressure control valve comprising an upstream portion and a downstream portion, wherein said pressure control valve upstream portion is in open communication with said hand tool inlet opening, said pressure control valve being located downstream of said hand tool inlet opening,

(f) a pressurized gas line which is in open communication, at one end, with said pressure control valve downstream portion, and said pressurized gas line being in open communication at the other end with said hand tool outlet opening,

(g) a container defining a cavity for receiving an agent for cleaning, disinfecting and/or lubricating the dental holder, angle piece, turbine piece, or the like mounted on said hand tool outlet opening, and

(h) at least one pump means for conveying said agent from said container to said hand tool outlet opening, wherein the upstream end of said pump means comprises a first conduit which is in open communication with the cavity of said container and wherein the downstream end of said pump means comprises a second conduit which is in open communication with said pressurized gas line.

4,892,113

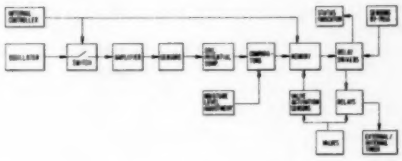
MOISTURE MONITOR AND CONTROL SYSTEM

Farrokh Fattahi, Boulder, Colo., assignor to Spectrum 2000, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 825,254, Feb. 3, 1986, abandoned. This application Jan. 20, 1987, Ser. No. 5,149

Int. Cl.[4] F16K *17/36*

U.S. Cl. 137—78.3 **18 Claims**



1. A system for monitoring moisture level in soil and controlling application of water to said soil, said system comprising:

(a) a plurality of sensing units disposed in said soil, each said sensing unit being adapted to monitor moisture content in said soil; wherein each said sensing unit is powered by low voltage, low current, alternating current having a frequency in the range of about 1.8 to 10 KHz and utilizes a square wave with fifty percent duty cycle; and

(b) control means which is electrically connected to each said sensing unit, wherein said control means is adapted to (i) compare said moisture content in said soil to a preset moisture requirement, and (ii) control the application of water to said soil; wherein said sensing units are periodically simultaneously activated to detect moisture content in said soil.

4,892,114

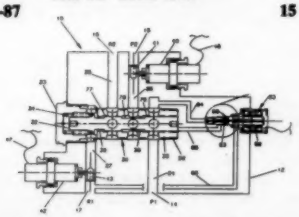
FLOW-SENSING SHUTOFF VALVE

G. Earl Maroney, Clarkston; Mark W. Dallas, Ortonville; Christopher West, Clawson; John A. Diemer, Auburn Hills, and Mark B. Chamberlin, Royal Oak, all of Mich., assignors to M. C. Aerospace Corporation, Lake Orion, Mich.

Filed Apr. 13, 1989, Ser. No. 337,334

Int. Cl.[4] G05D *7/00*

U.S. Cl. 137—87 **15 Claims**



1. A flow-sensing shutoff valve adapted to be installed in fluid pressure and return lines between upstream and down-

stream portions of a hydraulic system for isolating the downstream portion in response to a leakage condition therein, said valve comprising:

a valve body having fluid pressure entrance and fluid return exit ports connectable to the upstream fluid pressure and return lines, fluid pressure exit and fluid return entrance ports connectable to the downstream fluid pressure and return lines;

valve means within said valve body, and pressure and return passage means in said valve body for connecting said ports to said valve means, said valve means being movable between a normally open position in which said fluid pressure and fluid return entrance and exit ports are respectively connected by said pressure and return passage means and a closed position in which at least the connection between said fluid pressure entrance and exit ports is blocked;

pressure and return flowmeter means mounted in said valve body for sensing the fluid flow in said pressure and return passage means, said pressure and return flowmeter means being adapted to produce flow rate signals respectively proportioned to the pressure fluid flow and to the return fluid flow, and conditions in said pressure and return passage means upstream of said pressure and return flowmeter means;

control means connected to said pressure and return flow meter means for producing an output signal in response to a differential condition between said flow rate signals; and

actuator means for moving said valve means to said closed position in response to said output signal.

4,892,115

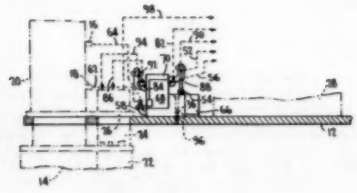
CONTROL VALVE ASSEMBLY

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Jun. 16, 1988, Ser. No. 207,509

Int. Cl.[4] G16K *11/00*

U.S. Cl. 137—269 **18 Claims**



1. A compact valve assembly for a multiple station machine, said valve assembly comprising a manifold including a base and an upstanding part integral with said base wherein said manifold is L-shaped in end elevation, said base having a front wall, a top wall, and a bottom wall, said upstanding part having a front wall, a rear wall and a top wall, said manifold having fluid passages extending through said base and said upstanding part, a first control valve mounted on said upstanding part rear wall and coupled to said fluid passages for controlling flow through said manifold, and said manifold forming a mounting support for at least one other control valve.

4,892,116

PLUMBING SEALING SYSTEM

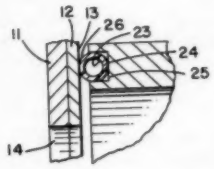
John J. Grasseschi, 1299 Grafton St., Worcester, Mass. 01609

Continuation of Ser. No. 91,506, Aug. 31, 1987, Pat. No. 4,756,332, which is a continuation of Ser. No. 943,312, Dec. 17, 1986, Pat. No. 4,706,702. This application Apr. 26, 1988, Ser. No. 186,450

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] F16L *5/00*

U.S. Cl. 137—360 **6 Claims**



1. Plumbing sealing system, comprising:

(a) a fixture including a flange adapted to lie with an edge in spaced relationship to a vertical wall surface adjacent an aperture in the wall, and

(b) a sealing element in the shape of an annulus of circular cross-section lying along and firmly attached to the said edge, while extending into the space between the plane of the edge and the wall surface, the sealing element being formed of an elastomer that is resilient and impervious to water, wherein the said edge of the flange defines a closed circular path confined to a single plane circumscribing the aperture in the wall, and wherein the sealing element has a porous, very resilient inner body completely surrounded by a non-porous, moderately-resilient skin, wherein the edge of the flange has a groove with a depth at least equal to the radius of the sealing element, and wherein the sealing element fits snugly in the groove.

4,892,117

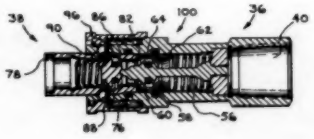
REFRIGERATION COUPLING

Robert D. Spalink, Jackson; Steven M. Knowles, Leslie, and John T. Kusztowny, Ann Arbor, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 10, 1988, Ser. No. 269,729

Int. Cl.[4] F16L *29/00*

U.S. Cl. 137—614.03 **1 Claim**



1. A coupling used in the charging and recharging of refrigeration circuits, comprising, in combination, a female part having an axial passage having an inner connection end and an open outer end, a male part having an axial passage having an inner connection end and an outer end adapted to be received within said female part outer end, connection means defined on said parts for selectively coupling said parts' open ends in coaxial communication, a first self-sealing valve within said passage of said male part axially moveable between open and closed positions having a maximum diameter, a first annular sealing ring mounted on said valve adjacent said maximum

diameter, said passage of said male part having a cylindrical sealing surface receiving and engaging said first sealing ring in said closed position, an annular recess defined in said male part passage adjacent said cylindrical surface, said first valve maximum diameter being radially aligned with said recess when said first valve is in said open position, a self-sealing valve sleeve within said passage of said female part axially moveable between open and closed positions and having an outer end, an inner cylindrical surface, and an annular recess between said valve outer end and said cylindrical surface, a coaxial probe fixed within said female part passage having a free end extending toward said female part open end and having a maximum diameter, a second annular sealing ring mounted on said probe adjacent said probe maximum diameter, said valve sleeve circumscribing said probe, said probe mounted sealing ring being received within and engaging said valve sleeve cylindrical surface when said valve sleeve is in said closed position, said valve sleeve recess being radially aligned with said probe maximum diameter when said valve sleeve is in said open position, said male and female parts each having releasable connection means for connecting said parts open outer ends to produce an open passage between said parts when fully coupled, a compression coil spring in each said parts biasing each said valve towards its closed position, said male part engaging said valve sleeve outer end and said probe engaging said first valve upon connection of said parts to displace said valve and valve sleeve to their open positions.

4,892,118

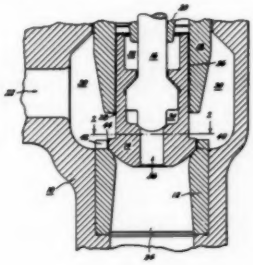
SILENT VALVE

Donald H. Davis, Scotia; Jens Kure-Jensen, and Solomon Jenkins, III, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 395,603, Jul. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 192,481, Sep. 30, 1980, abandoned. This application Mar. 21, 1985, Ser. No. 714,348

Int. Cl.[4] F16K *47/02*

U.S. Cl. 137—625.3 **14 Claims**



1. A valve for quietly controlling flow of steam comprising:

a pressurizable valve body including an inlet port and an outlet port;

a valve seat disposed within said body between said inlet port and said outlet port;

a cylindrical valve plug movable against said valve seat in an axial direction for continuously controlling the flow of steam between said inlet port and said outlet port, whereby a contact region between said valve seat and said valve plug is defined; and,

a cylindrical slotted member affixed to said valve seat and extending a predetermined distance upstream with respect to said valve seat, said slotted member for dividing said flow of steam into a plurality of fluid streams at low valve lift such that the frequency spectrum of noise energy from the flow of steam through said slotted member is shifted toward supra-audible frequency so that audible noise is reduced, said slotted member disposed immediately adjacent said contact region, the predetermined distance of said slotted member limited with respect to valve lift such that at high valve lift substantially all flow of steam from said inlet port to said outlet port bypasses said slotted member, said slotted member open at the predetermined distance from said seat to permit smooth transition from partially restricted flow of steam at low valve lift to substantially unrestricted flow of steam at high valve lift, wherein continuous control of flow of steam from said inlet port to said outlet port is obtained by said valve plug.

4,892,119

CHANGING CLOTH BEAMS IN A WEAVING MILL

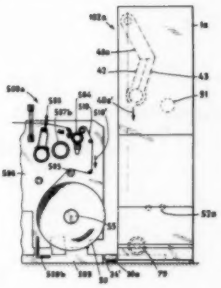
Schilling Hugo, Winterthur, Switzerland; Günter Veith, Münsingen-Dottingen, Fed. Rep. of Germany, and Zünd Marcel, Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 13, 1988, Ser. No. 206,185

Claims priority, application Switzerland, Jun. 16, 1987, 02268/87

Int. Cl.[4] D03D *49/00*

U.S. Cl. 129—1 R **14 Claims**



1. A method of changing cloth beams in a weaving mill comprising the steps of

transferring a full cloth beam from a weaving machine into a predetermined position in a transporter;

moving a wind-on beam into the path of fabric between the weaving machine and full cloth beam to form a loop of fabric;

moving the wind-on beam with the loop of fabric about a fresh cloth beam in the transporter;

cutting the fabric between the fresh cloth beam and full cloth beam;

positioning a free cut end of the fabric against the fresh cloth beam;

rotating the fresh cloth beam to wind the fabric thereon over the free cut end of the fabric; and

transferring the fresh cloth beam with the fabric windings thereon to the weaving machine.

4,892,120

APPARATUS FOR REGULATING THE JAW OF THE CUTTING RAILS IN FACE-TO-FACE WEAVING LOOMS

Roger Bostyn, Kortrijk/Marke, Belgium, assignor to N.V. Michael Van de Weile, Kortrijk/Marke, Belgium

Filed Oct. 7, 1988, Ser. No. 254,820

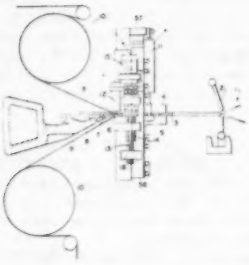
Claims priority, application Belgium, Oct. 10, 1987, 01167

Int. Cl.[4] D03D *39/18*

U.S. Cl. 139—21 **12 Claims**

1. Cutting device to split a face-to-face woven fabric, consisting of a fixed cutting bank (8) over which a knife carriage (7) provided with a knife blade (6) moves to-and-fro, and of a top cutting rail (4) and a bottom cutting rail (5), both of which

are arranged for vertical adjustment in relation to the knife blade (8), and which respectively form top and bottom guides for the unsplit face-to-face fabric (3), characterized in that the



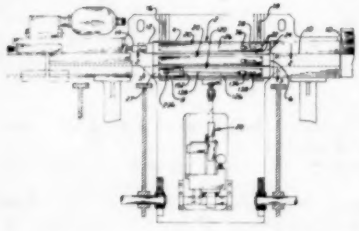
cutting device is provided with at least one electronic displacement transducer which produces a signal proportional to the position of the top and bottom cutting rails (4, 5) respectively in relation to the knife blade.

4,892,121

BLADDER TYPE SHUTTLE BRAKING APPARATUS FOR LOOMS

Charles M. Brown, Starkville, Miss., assignor to Niagara Lockport Industries Inc., Quincy, Fla.

Filed Jul. 14, 1988, Ser. No. 219,090
Int. Cl.[4] D03D *49/54*
U.S. Cl. 139—185 **9 Claims**



1. A shuttle braking apparatus for use in a shuttle box cell on a weaving loom having a selectively controllable source of pressurized fluid and in which a shuttle is picked along a shuttle raceway between two opposing shuttle box cells and in which the shuttle cells have a plurality of walls extending generally parallel to the shuttle raceway with the shuttle cell being aligned with the raceway for receiving a shuttle moving along the raceway, said braking apparatus having at least a portion thereof extending inwardly of at least one cell wall and comprising

a support member joined to said cell wall;

a shuttle engaging member having at least one surface for engaging a shuttle entering said cell;

at least one selectively inflatable and deflatable bladder interposed between said support member and said shuttle engaging member for urging said shuttle engaging member inwardly of said cell upon inflation of said bladder by selective introduction of pressurized fluid thereinto, such that inflation of said bladder will urge said shuttle engaging member toward a position interfering with movement of a shuttle within said cell, whereby inflation of the bladder will serve to brake movement of a shuttle within the cell; and

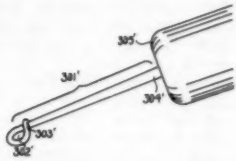
means for urging said bladder to a deflated condition upon selective release of said pressurized fluid therefrom to move said shuttle engaging member away from engagement with a shuttle within said cell when said bladder is deflated.

4,892,122

PROBE PIN ALIGNMENT TOOL

John M. Ickes, Emmett, Id., assignor to Micron Technology Inc., Boise, Id.

Filed Dec. 19, 1988, Ser. No. 286,855
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—123 **2 Claims**



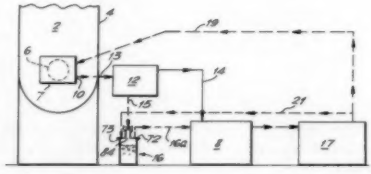
1. Apparatus for bending a probe pin, comprising a member attached to a handle, having a substantially closed aperture with a general diameter larger than a diameter of the probe pin, so that said aperture can be easily positioned around the probe pin, said member being made of wire at least as stiff as the probe pin and having a substantially straight shaft, a first end of said shaft being formed into at least one loop, so making said aperture, and a second end of said shaft connected to said handle, said first end being wrapped at least partially around said shaft, to prevent said aperture from flexing open, and said first end's cross-sectional area being less than said second end's cross-sectional area.

4,892,123

PNEUMATIC CONVEYING SYSTEM

Patrick G. Sheehan, Mid Glamorgan, United Kingdom, assignor to Technivac Limited, Mid Glamorgan, United Kingdom

Filed Aug. 25, 1988, Ser. No. 236,465
Claims priority, application United Kingdom, Aug. 25, 1987, 8719993; Aug. 25, 1987, 8719994
Int. Cl.[4] B65B *1/16*
U.S. Cl. 141—7 **11 Claims**



1. A method of discharging particulate material from a reactor, which comprises:

(a) providing a drain zone in said reactor and a gas/solids separator for operation on particulate material from said reactor and pneumatically conveying said particulate material from said drain zone of said reactor via a first vacuum line, to said gas/solids separator;

(b) providing a receiving vessel, having a top portion, for receiving said particulate material from said gas/solids separator and arranging a cover member having a gas inlet, a gas outlet and an inlet port in sealing engagement on the top portion of the receiving vessel, feeding said particulate material from said gas/solids separator to said

receiving vessel via a substantially gas-tight line from said gas solids separator to said inlet port;

(c) recycling the majority of the gas from said gas/solids separator to said drain zone via a main vacuum return line;

(d) drawing substantially the remainder of the gas from said gas/solids separator to said receiving vessel via a further vacuum line and the gas inlet provided on said cover member; and

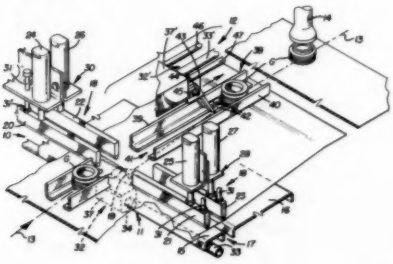
(e) passing gas from said receiving vessel, via the outlet port provided on said cover member and an auxiliary vacuum return line, to said main vacuum return line, said cover member being mounted for movement towards and away from said receiving vessel such that successive ones of a series of receiving vessels can be selectively covered by said cover member and filled with said particulate material.

4,892,124

CROSS-CUTTING APPARATUS AND CONVEYOR FOR BAG FILLING MACHINES

Peter N. Thomsen, 138 Baumont Ave., San Francisco, Calif. 94118

Filed Dec. 6, 1988, Ser. No. 280,710
Int. Cl.[4] B65B *43/42, 3/16*
U.S. Cl. 141—114 **12 Claims**



1. A machine for moving at least one pair of bags along a path disposed in a horizontal plane and for then cutting said bags from each other, said bags being connected together at a severable parting line extending transversely relative to said path, said machine comprising

a frame,

conveyor means mounted on said frame for intermittently moving said pair of bags along said path,

first and second platens mounted on said frame and spaced apart in the direction of said path to define an opening between said platens, extending transversely relative to said path,

clamping means movably mounted above said platens for engaging and clamping a leading end of a trailing bag and a trailing end of a leading bag of said pair of bags to said first and second platens, respectively, to position the severable parting line, connecting said pair of bags together, over said opening, said

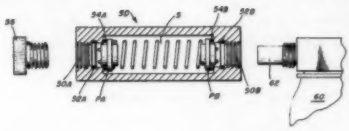
cutting means, including a cutting blade, mounted on said frame for severing the parting line connecting said pair of bags together by moving said cutting blade in said horizontal plane and transversely through said opening.

4,892,125

SYSTEM FOR SERVING A PRE-MIX BEVERAGE OR MAKING AND SERVING A POST-MIX BEVERAGE IN THE ZERO GRAVITY CONDITIONS OF OUTER SPACE

Arthur G. Rudick, Marietta; Richard H. Heenan, Atlanta, and William S. Credle, Jr., Stone Mountain, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 769,464, Aug. 26, 1985, Pat. No. 4,785,974. This application Jun. 23, 1988, Ser. No. 211,271
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—353 **5 Claims**



1. A system for making and serving a carbonated post-mix beverage in the zero gravity conditions of outer space comprising:

(a) a flavor concentrate module including a tubular housing with threaded inlet and outlet ports and spring biased poppets in each of said ports for normally closing said ports;

(b) a pre-measured amount of flavor concentrate disposed within said module;

(c) a source of carbonated water coupled to the inlet port of said module and having means for opening the poppet in the threaded inlet port and engaging the threaded inlet port for introducing carbonated water into said module for mixing with flavor concentrate to form the carbonated post-mix beverage; and

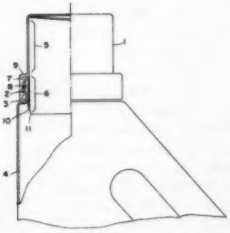
(d) a drinking container having tube means attached thereto, said tube means having a threaded fitting for engaging the threaded outlet port extending into the outlet port of said module to open the spring biased poppet therein and permit the carbonated post-mix beverage to flow into said drinking container.

4,892,126

THREADED DOSING CAP

Herbert Bucheler, Erkrath, and Paul O. Weltgen, Hilden, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 537,415, Sep. 6, 1983, abandoned. This application Nov. 30, 1988, Ser. No. 277,855
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207223
Int. Cl.[4] B65D *51/24*
U.S. Cl. 141—381 **2 Claims**



1. In combination with a container having an externally threaded, reduced neck area, said neck area having an inner surface of predetermined length and an upper circular extrem-

ity, said neck area opening into a wider container volume, a dosing cap comprising:

a beaker type dosing cylinder having a drain ring which extends into and through said predetermined length of said reduced neck area, said drain ring wipingly bearing against said inner surface of said reduced neck area over its entire predetermined length to create a seal therebetween and having a lower-most portion which narrows from the inner surface of said reduced neck area and terminates with a sharp edge oriented obliquely inward; and

a skirt extending outwardly from said dosing cylinder and concentrically arranged thereabout, said skirt extending over said upper circular extremity of said reduced neck area and having internal threads, said skirt forms a seal when its internal threads are fully engaged with said external threads of said reduced neck area.

4,892,127

SNOW CHAIN HAVING A NETWORK OF DIAMOND SHAPED OPENINGS

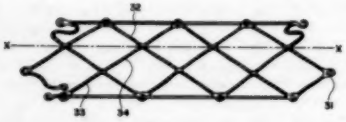
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 701,345, Feb. 13, 1985. This application Dec. 16, 1987, Ser. No. 133,744

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] B60C *27/10*

U.S. Cl. 152—221 **18 Claims**



1. A continuous snow chain for automobile tires comprising in combination:

(a) a network of flexible elongated elements including at least two rows of diamond-shaped openings disposed adjacent and parallel to one another;

(b) a first retainer flexible elongated member connected to one edge of said network at each zig-zag point on said one edge; wherein said first retainer flexible elongated member includes means for removably connecting two extremities thereof to one another;

(c) a second retainer flexible elongated member connected to the other edge of said network opposite to said one edge at each zig-zag point on said the other edge wherein said second retainer flexible elongated member includes means for removably connecting two extremities thereof to one another;

(d) a first and second flexible elongated members extending from one end-most junction of the first row of said diamond-shaped openings, wherein the first flexible elongated member is connected to said second retainer flexible elongated member and the second flexible elongated member includes a first half of a coupling means disposed at a mid portion thereof and a first half of a connecting means disposed at the extremity thereof;

(e) a third flexible elongated member extending from one end-most junction of the second row of said diamond-shaped openings adjacent to said one end-most junction of the first row of said diamond-shaped openings and connected to said first retainer flexible elongated member, said third flexible elongated member including a second half of said connecting means disposed at the extremity thereof;

(f) a fourth flexible elongated member extending from the other end-most junction of the first row of said diamond-shaped openings opposite to said one end-most junction and connected to said second retainer flexible elongated member; and

(g) a second half of said coupling means disposed at the other end-most junction of the second row of said diamond-shaped opening opposite to said one end-most junction of the second row and wherein the first or second half of said coupling means comprises at least an open-link member or an angle-link member.

4,892,128

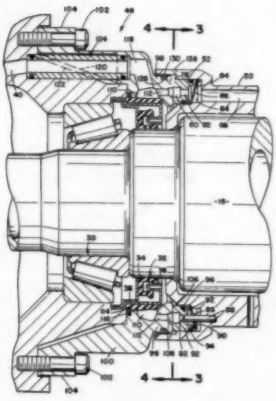
VEHICLE WHEEL SEAL ASSEMBLY

Josef A. Bartos, Diamond Bar, Calif., assignor to Tire Inflation Systems Corp., Willoughby, Ohio

Continuation-in-part of Ser. No. 91,057, Aug. 28, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,041

Int. Cl.[4] B60C *23/00*

U.S. Cl. 152—417 **46 Claims**



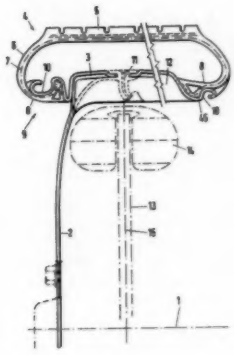
1. A wheel seal assembly for a vehicle having an onboard system for controlling the pressure of air in a tire of the vehicle, said system including a source of air under pressure, said vehicle having wheel means carrying said tire, wheel support means having an axis, and means supporting said wheel means on said wheel support means for rotation about said axis, said seal assembly comprising first annular seal means surrounding said wheel support means and coaxial therewith, means supporting said first annular seal means on said wheel support means for reciprocating movement axially thereof and against rotation relative to said axis, said first annular seal means having first annular sealing surface means in a plane transverse to said axis, second annular seal means coaxial with said axis, means supporting said second annular seal means for rotation with said wheel means, said second annular seal means having second annular sealing surface means in a plane transverse to said axis and facially engaging said first annular sealing surface means, means biasing said first annular seal means toward said second annular seal means to maintain said facial engagement, said first and second annular seal means respectively having first and second air flow passageway means opening axially through the corresponding sealing surface means to provide for flow across said facially engaging first and second annular sealing surface means, means for connecting said first air flow passageway means to said source of air under pressure, and means for connecting said second air flow passageway means with said tire.

4,892,129

TIRE UNIT AND PROCESS FOR MANUFACTURING SAME

Klaus Debus, Am Schwarzen Moor 13, 2070 Ahrensburg, Fed. Rep. of Germany

PCT No. PCT/EP87/00011, § 371 Date Sep. 16, 1987, § 102(e) Date Sep. 16, 1987, PCT Pub. No. WO87/04395, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 12, 1987, Ser. No. 116,568
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601316
Int. Cl.[4] B60C *15/036*; B29D *30/20*
U.S. Cl. 152—516 19 Claims



1. A tire unit comprising:

a wheel having a circumferential rim (3) for rotation about a wheel axis (1), the rim having axially outer edges (10) on either side of a radial plane (15) which is perpendicular to the wheel axis, each rim edge having an axially outer tire support surface (26) and an adjacent tire interface surface including an axially inner undercut (28) as the rim is viewing in a direction parallel to the wheel axis (1);

a coreless air tire (4) unreleasably secured to the rim and including two annular edges located on either side of said radial plane and confronting the tire interface surface of the rim edge, a tread spaced from the rim and extending substantially parallel to the wheel axis (1), and tire side walls extending between the tire edges and the tread;

a main bonding connection (23), for transmitting operating forces from the tire to the rim, in which at least a portion of a tire edge is bonded to a respective tire interface surface on the rim, wherein all points (24) included by the bonding connection have a tangent forming an angle (25) to the wheel axis (1) that is no smaller than the angle of the tangent to the interface surface at any point which lies closer to the support surface, or is smaller than the angle (20) between the tire wall (6) and the wheel axis (1) at the innermost point (17) at which the tire side wall (6) is spaced from the rim edge (10), under all normal loading conditions, so that only positive normal forces in the bonding connection are transmitted from the tire edge to the rim edge; and

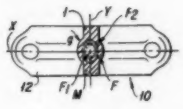
annular reinforcement means (29) carried by the tire edge and interacting with the undercut (28), for reinforcing the bonding connection, said annular reinforcement means including a portion filling the undercut (28), said portion consisting of nonmetallic deformable material.

4,892,130

METHOD FOR MAKING A REINFORCED ARTICLE FOR AN INTERNAL COMBUSTION ENGINE

Keisuke Ban, Fujimi, and Akimasa Daimaru, Omiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 418,502, Sep. 15, 1982, Pat. No. 4,534,400. This application Jan. 28, 1985, Ser. No. 695,595
Claims priority, application Japan, Sep. 16, 1981, 56-145990
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] B22D *19/14*
U.S. Cl. 164—97 5 Claims



1. Method of making a reinforced cast article, said article having end portions and a center portion, comprising the steps of

forming a bundle of inorganic reinforcing uni-directional fibers, with said fibers uni-directional in said bundle, said bundle including a proportion of metallic fibers,

placing said bundle, with said fibers uni-directional, in a heat-resistant shaping container,

heating said contained bundle to partially fuse said metallic fibers to each other uni-directional in said bundle,

positioning said partially fused uni-directional bundle of said fiber into a mold having cavities for producing said article leaving a fixed minimum gap surrounding said bundle in a section of said cavities for producing said center portion, and

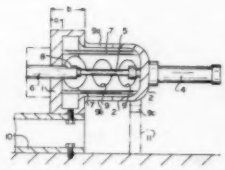
squeeze casting a molten light metal alloy into said mold and forming a matrix of said alloy and said uni-directional bundle of said fiber.

4,892,131

INJECTION APPARATUS OF DIE CAST MACHINES

Toyoaki Ueno, Yoshiki, Japan, assignor to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 741,239, Jun. 4, 1985, abandoned, which is a continuation of Ser. No. 459,840, Jan. 21, 1983, abandoned. This application Apr. 27, 1989, Ser. No. 346,368
Claims priority, application Japan, Jan. 26, 1982, 57-8202
Int. Cl.[4] B22D *17/10*
U.S. Cl. 164—312 5 Claims



1. An injection apparatus mounted for operation with substantially horizontal stroke and comprising a support for an injection sleeve, injection cylinder and an injection plunger structured to support the injection plunger in concentric, non-deviating alignment with the injection sleeve and the injection cylinder, said support comprising a rigid end plate, a rigid flange bounding the end plate and perpendicular thereto, a rigid frame of lesser diameter than said flange concentric with the flange and flared to extend to join said flange, said frame embodying an end wall spaced from and parallel to the end

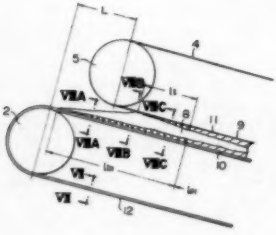
plate, said end plate and said end wall containing concentric aligned openings, said injection sleeve fixed in the opening in the end plate, said injection cylinder fixed in the opening in said end wall and containing a piston and a piston rod extending therefrom through said opening in the end wall, said piston rod being connected at its distal end to the plunger in the injection sleeve, said flange being of substantially greater axial length than the axial thickness of the end plate such as to impart rigidity to the end plate to provide for minimum thickness of the end plate and minimal length of the injection sleeve while maintaining alignment between the injection sleeve and the injection plunger and wherein said end plate, flange, frame, and end wall constitute a unit formed as an integral one-piece structure and wherein said frame effectively reduces the bending span of said end to thereby reduce bending deflection due to injection pressure on the face of said end plate.

4,892,132

CASTING METHOD AND APPARATUS USING TWIN BELT CASTER

Takashi Asari, Nihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,312
Claims priority, application Japan, Oct. 29, 1987, 62-271675
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—431 **4 Claims**



1. A casting method making use of a twin belt caster having an upper belt, a lower belt and dam members disposed between both opposing longitudinal edges of said upper and lower belts, said upper belt, lower belt and dam members in cooperation providing a continuous casting mold which is inclined at a predetermined angle from the horizontal plane and into which a melt of steel is poured, said method characterized in that said lower belt has a smaller heat conductivity than said upper belt so that solidification of said melt in the region adjacent to said lower belt is retarded as compared with the region adjacent to said upper belt.

4,892,133

PROCESS FOR MONITORING AND REGULATING THE LUBRICATION OF THE WORKING FACE OF THE ROTARY ROLLS OF A CONTINUOUS STRIP CASTING MACHINE

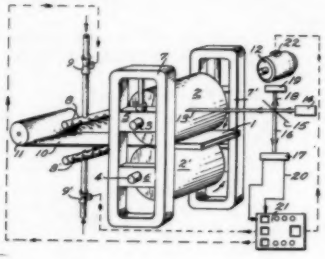
Philippe Solignac, Saint Egreve, France, assignor to Cegedure Societe de Transformation de l'Aluminum Pechiney, Paris, France

Filed Sep. 16, 1988, Ser. No. 245,636
Claims priority, application France, Oct. 14, 1987, 87 14491
Int. Cl.[4] B22D *11/07*
U.S. Cl. 164—452 **12 Claims**

1. A process for monitoring and regulating lubrication of a working face for rotary rolls of continuous strip casting machine, said process comprising the steps of:

directing at least one beam of coherent light on to at least one of the following (a) a lubricated working face of each of the rolls, (b) each lubricated face of a strip, and (c) a lubricated face of a roll and a lubricated face of a strip opposite to said roll;

measuring values representing mean strength and mean frequency of variations of said at least one beam being reflected by said lubricated faces;



comparing said measured values to values determined during reference intervals; and

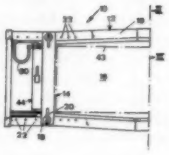
adjusting at least one of the following, based on the step of comparing said measured values to said values determined during the reference intervals, (a) the speed of rotation of said rolls, and (b) the lubricated flow rate.

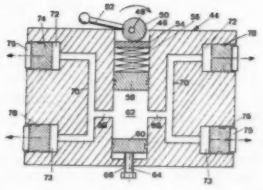
4,892,134

ELECTROMAGNETIC MOLD FOR CONTINUOUS CASTINGS

Laurent Zuber, Chalais, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 14, 1985, Ser. No. 701,962
Claims priority, application Switzerland, Feb. 22, 1984, 848/84
The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—503 **4 Claims**





1. A mold for use in the electromagnetic casting of molten metal comprising a pair of side walls and a pair of end walls, each of said side walls and said end walls being provided with an inductor portion and a screen portion, means provided on one of said side walls and said end walls for selectively positioning and securing said one of said side walls and said end walls at different positions on the other of said side walls and said end walls for adjusting the size of the mold cavity and

means for providing electrical contact between the inductor portions of said side walls and said end walls and the screen portions of said side walls and said end walls so as to form an inductor characterized by a closed loop and a screen characterized by a closed loop, said means for providing electrical contact comprises a fluid link having a compression cylinder in fluid communication with a plurality of motor cylinders, said plurality of motor cylinders each being provided with a motor piston having one end in biasing contact with one of said inductor and said screen and the other end in contact with the fluid in said fluid link and a compression piston means reciprocally mounted in said compression cylinder for compressing said fluid so as to bias said motor pistons against one of said inductor and said screen.

4,892,135

AIR CONDITIONER FOR AUTOMOBILES WITH HOT/REFRIGERATION COMPARTMENT FOR STORED ARTICLES

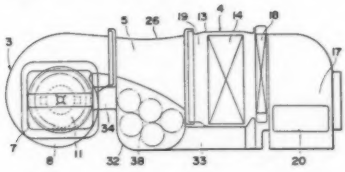
Muneo Sakurada; Isamu Kurosawa, and Shinji Wakabayashi, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 111,799, Oct. 22, 1987, Pat. No. 4,834,170. This application Dec. 27, 1988, Ser. No. 290,122

Claims priority, application Japan, Nov. 21, 1986, 61-179191; Mar. 12, 1987, 62-36517; Mar. 23, 1987, 62-68700

Int. Cl.[4] F25B *29/00*; F25D *17/08*

U.S. Cl. 165—42 **5 Claims**



1. An automobile air conditioner comprising:

a casing comprising sides;

a blower unit including blower means for blowing air through the air conditioner in a flow direction, and a duct connected between said blower unit and said casing and in which an air flow passage is defined through which air blown by said blower means flows in said flow direction into said casing;

a first heat exchanger means disposed in said casing for cooling air passing therethrough;

a second heat exchanger means disposed in said casing downstream from with respect to said flow direction and adjacent to said first heat exchanger means for heating air passing therethrough,

said second heat exchanger means extending from one of said sides of said casing in a direction generally perpendicular to said flow direction to a location spaced from the other of said sides of said casing, a bypass passage defined between said second heat exchanger means and said other side of said casing;

an air distribution chamber defined in said casing open to said second heat exchanger means and disposed immediately downstream thereof with respect to said flow direction,

said air distribution chamber having an upper portion in which a defrost air outlet and an upper air outlet are defined, and a lower portion in which a lower air outlet is defined;

bypass control means disposed in said bypass passage for regulating the amount of air flowing through said bypass passage; and

a hot/refrigeration compartment means juxtaposed with said duct for heating or cooling articles stored therein,

said hot/refrigeration compartment means including a first connecting passage in communication with said casing in a manner in which at least one of air having passed through said first heat exchanger means and air having passed through said second heat exchanger means is able to pass through said first connecting passage to said hot/refrigeration compartment means, and a second connecting passage in communication with said blower unit in a manner in which air within said hot/refrigeration compartment means is able to pass through said second connecting passage to said blower unit.

4,892,136

HEAT EXCHANGER

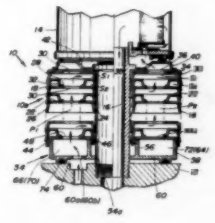
Takayuki Ichihara, Tokyo; Takeji Yogo; Masuhito Iinuma, both of Sakado; Eriya Arita, Kawagoe, and Haruo Yokoo, Iruma, all of Japan, assignors to Kabushiki Kaisha Tsuchiya Seisakusho, Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,842

Claims priority, application Japan, Dec. 31, 1986, 61-199103[U]; Dec. 31, 1986, 61-199104[U]; Dec. 31, 1986, 61-199106[U]; Jun. 30, 1987, 62-100884[U]; Jun. 30, 1987, 62-100880[U]

Int. Cl.[4] F28F *13/12, 19/00*

U.S. Cl. 165—51 **16 Claims**



1. A heat exchanger for first and second fluids, comprising:

a heat exchange element including a plurality of heat transmission plates disposed one upon another, means for securely connecting said heat transmission plates to define a first fluid flowing space and a second fluid flowing space on opposite sides of each heat transmission plate, the first fluid flowing through said first fluid flowing space, the second fluid flowing through said second fluid flowing space, and means defining a first fluid passage communicating with said first fluid flowing space, and second and third fluid passages communicating with said second fluid flowing space;

a generally cup-shaped one-piece cover fixedly secured to said heat exchange element and said cover defining a first chamber communicating with said first fluid passage in said heat exchange element, and second and third chambers communicating respectively with said second and third fluid passages in said heat exchange element, each of said first, second and third chambers communicating with outside of said cover; and

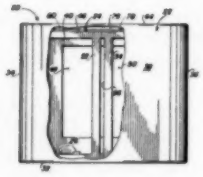
means for securely fixing said heat exchange element to a mount member on which said heat exchanger is mounted, in a manner that said cover is interposed between said heat exchange element and the mount member, said fixing means including means for pressing said cover into said mount member.

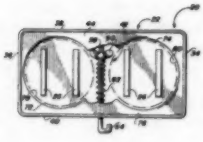
4,892,137

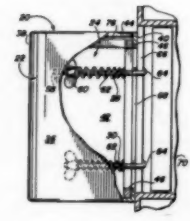
BEVERAGE TEMPERATURE CONTROLLER FOR A VEHICLE

Frank F. Bibik, Jr., 7010 Sepulveda Blvd., #212, Van Nuys, Calif. 91405

Filed Dec. 20, 1988, Ser. No. 286,823
Int. Cl.[4] B60H *1/32, 1/12*
U.S. Cl. 165—80.1 9 Claims







1. An improved beverage temperature controller for a vehicle, said controller comprising, in combination:

(a) a hollow housing having a closed generally horizontal bottom and interconnected closed upraised sides, front and rear, defining collectively a central beverage storage space and an open top with access to said space, said housing rear having an opening providing access to said storage space;

(b) a beverage container holder in said housing storage space having a vertical beverage container opening therein spaced from said sides, front and rear to provide a circulation pathway around a beverage container when in said holder;

(c) bottom spacers disposed on the upper surface of said housing bottom to separate a beverage container, when in said holder, from said bottom for improved air circulation around said beverage container; and,

(d) housing connector means secured to said housing rear and adapted to releasably interconnect said rear to a vehicle air temperature conditioning unit, with said rear opening over a vent of said air temperature conditioning unit,

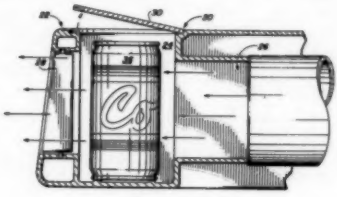
(e) wherein said holder comprises a ring disposed between and secured by struts to said housing sides and/or rear and front.

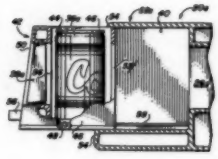
4,892,138

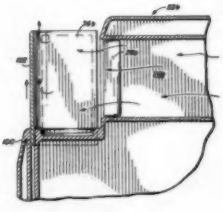
BEVERAGE TEMPERATURE CONTROLLING ASSEMBLY FOR A VEHICLE

Frank F. Bibik, Jr., 7010 Sepulveda Blvd., #212, Van Nuys, Calif. 91405

Filed Jan. 30, 1989, Ser. No. 303,323
Int. Cl.[4] F28F *7/00;* B60H *1/08, 1/32*
U.S. Cl. 165—80.1 8 Claims







1. An improved beverage temperature controlling assembly for a vehicle, said assembly comprising, in combination:

(a) a dashboard containing an air duct below the top of said dashboard, said duct leading from a vehicle air temperature conditioning unit to an exhaust vent in said dashboard; and,

(b) means integrally connected to said dashboard for releasably positioning a beverage container within said air duct to provide a circulation path around said container to cool or heat said container.

4. An improved beverage temperature controlling assembly for a vehicle, said assembly comprising, in combination:

(a) a dashboard containing an air duct below the top of said dashboard, said duct leading from a vehicle air temperature conditioning unit to an exhaust vent in said dashboard; and,

(b) means integrally connected to said dashboard for releasably positioning a beverage container within said air duct to provide a circulation path around said container to cool or heat said container,

(c) wherein said dashboard carries a drawer aligned with the front of said duct and slidable between a rear position within said dashboard and a forward position out of said dashboard, said drawer having a front end bearing said

vent and a rear open end whereby air can freely pass forward from said duct through said drawer and out of said vent, said drawer having a closed bottom and open top and being adapted to releasably support at least one of said beverage containers therein.

6. An improved beverage temperature controlling assembly for a vehicle, said assembly comprising, in combination:

(a) a dashboard containing an air duct below the top of said dashboard, said duct leading from a vehicle air temperature conditioning unit to an exhaust vent in said dashboard; and,

(b) means integrally connected to said dashboard for releasably positioning a beverage container within said air duct to provide a circulation path around said container to cool or heat said container,

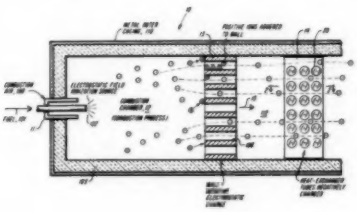
(c) wherein said positioning means includes a ledge connected to said dashboard and extending directly below and in front of said vent, said ledge being adapted to support a beverage container in front of said vent to control the temperature thereof.

4,892,139

MEANS AND METHOD FOR PREVENTING UNWANTED ACCUMULATION IN HEAT EXCHANGERS

Paul G. LaHaye, Cape Elizabeth, Me., and Eric R. Norster, Holliston, Mass., assignors to H.P.S. Merrimack Corp., South Portland, Me.

Filed Jul. 11, 1988, Ser. No. 217,454
Int. Cl.[4] F28G *1/00*
U.S. Cl. 165—95 **18 Claims**



1. A method of preventing restrictive accumulation of particulate matter on a heat exchanger element while passing a gas stream laden with particles over said element,

said method comprising maintaining an electrical charge of a first polarity on said particles,

maintaining an electrical charge of the same polarity as said first charge on said heat exchange element.

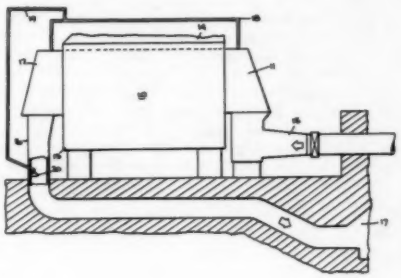
4,892,140

CONDENSER VENT SIPHON LINE

Tito D. Honovich, 149-24 21st Ave., Whitestone, N.Y. 11357

Filed Nov. 21, 1988, Ser. No. 273,844
Int. Cl.[4] F28B *1/02, 9/10*
U.S. Cl. 165—110 **21 Claims**

1. In combination with a condenser having an inlet water box and an outlet water box, an arrangement for using the flow of coolant water being discharged from the condenser to create a partial vacuum in a conduit means leading form conduit openings in a top portion of the inlet and outlet water boxes of the condenser to a lower opening of the conduit means within the discharging flow path of said coolant water from said condenser, to withdraw air and non-condensible gases from



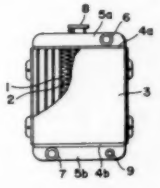
the water boxes through said conduit means to discharge into said discharging coolant water flow.

4,892,141

FIN OF HEAT EXCHANGER AND METHOD OF MAKING IT

Shoji Shiga; Akira Matsuda; Hideo Suda, and Nobuyuki Shibata, all of Nikko, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 873,641, Dec. 27, 1988, abandoned.
This application Jun. 27, 1989, Ser. No. 372,158
Int. Cl.[4] F28F *19/02*
U.S. Cl. 165—133 **12 Claims**



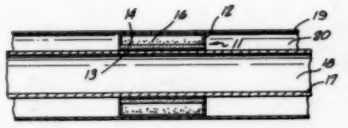
1. A fin for a heat exchanger comprising a Cu-Zn diffused layer having a Zn content of not less than 1 wt % formed on at least a portion of the surface of a Cu-based fin substrate, wherein the concentration of Zn decreases continuously from the outside surface of the Cu-Zn diffused layer to the interface between that layer and the Cu-based fin substrate.

4,892,142

DEVICE AND METHOD FOR REMOVING GASEOUS IMPURITIES FROM A SEALED VACUUM

Isaac J. Labaton, Jerusalem, Israel, assignor to Luz Industries Israel, Ltd., Jerusalem, Israel

Filed May 5, 1989, Ser. No. 348,060
Int. Cl.[4] F28F *13/00*
U.S. Cl. 165—134.1 **14 Claims**



1. A device for removing hydrogen from a vacuum insula-

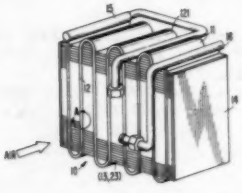
tion jacket for a vessel or pipe which holds or through which flows a hydrogen-containing medium at temperatures such that hydrogen permeates into the vacuum insulation jacket, comprising a container which contains oxygen or an oxygen generating material, and a palladium or palladium alloy membrane closing the container such that a first side of said palladium membrane facing the interior of the container is exposed to a region of relatively high oxygen pressure and relatively low hydrogen partial pressure, and a second side of said palladium or palladium alloy membrane is exposed to the vacuum having a relatively low oxygen partial pressure and a relatively higher hydrogen partial pressure, whereby the palladium membrane acts as a catalyst for the combination of hydrogen and oxygen to form water when hydrogen flows from the vacuum jacket into the container which contains oxygen following the hydrogen pressure gradient.

4,892,143

HEAT EXCHANGER

Yutaka Ishii, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jan. 23, 1989, Ser. No. 299,988
Claims priority, application Japan, Jan. 21, 1988, 63-5283[U]
Int. Cl.[4] F28D *1/047*; F28F *1/24*
U.S. Cl. 165—152 **2 Claims**



1. In an evaporator for use in a refrigeration circuit, said evaporator including a serpentined tube comprising a plurality of spaced, essentially parallel planar portions and a plurality of curved portions interconnecting said parallel portions, refrigerant fluid flowing through said serpentined tube, at least one corrugated fin unit fixedly disposed between opposed parallel planar portions, said fin unit including a plurality of spaced essentially parallel surfaces and a plurality of louvers formed through said surfaces of said corrugated fin unit and terminating a predetermined distance from the surfaces of said parallel portions of said serpentined tube, the improvement comprising:

said predetermined distance being selected from the range of from over 0.5 mm to under 1.0 mm.

4,892,144

INFLATABLE TOOLS

Malcolm G. Coone, Katy, Tex., assignor to Davis-Lynch, Inc., Pearland, Tex.

Filed Jan. 26, 1989, Ser. No. 301,862
Int. Cl.[4] E21B *33/127, 33/129*
U.S. Cl. 166—122 **27 Claims**

1. An inflatable tool, comprising

a mandrel adapted to be arranged concentrically with respect to a cylindrical wall and including a tubular section having upper and lower heads thereabout which are longitudinally movable relatively toward and away from one another, and

an inflatable element adapted to be moved into engagement with the wall, said inflatable element including

a sleeve of elastomeric material arranged concentrically of the tubular section of the mandrel and anchored at each longitudinal end to the heads,

substantially flat, relatively rigid but flexible strips arranged concentrically of the side of the sleeve opposite the tubular section and with their sides in overlapping relation,

means anchoring the longitudinal ends of the strips to the heads while leaving their intermediate portions free to move radially toward the wall in response to inflation of the sleeve, said anchoring means comprising

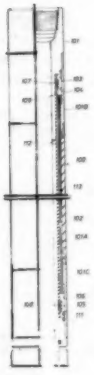
means in each head having radially inner and outer walls confining the radially inner and outer side edges of the strips and a shoulder about one wall which faces away from the shoulder about one wall of the other head,

a portion which extends from each end of each strip to dispose its longitudinally inner end edge over the shoulder, said portion being inclined at an acute angle with respect to the longitudinal and extending in a direction from one side edge toward its other side edge, and

spacers between the portions of adjacent strips.

16. A packer, comprising

a mandrel adapted to be arranged concentrically with respect to a cylindrical wall and including a tubular section having upper and lower heads thereabout which are longitudinally movable relatively toward and away from one another, and



an inflatable element adapted to be moved into engagement with the wall of the well bore, said inflatable element including

a sleeve of elastomeric material arranged concentrically of the tubular section and anchored at each longitudinal end to the heads,

substantially flat, relatively rigid but flexible strips arranged concentrically of the side of the sleeve opposite the tubular section and with their sides in overlapping relation, and

means anchoring the longitudinal ends of the strips to the heads while leaving their longitudinally intermediate portions free to move radially toward the wall in response to inflation of the sleeve, and

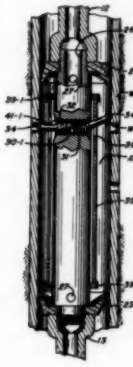
another sleeve of elastomeric material arranged concentrically of the sides of at least a portion of the strips opposite the first mentioned sleeve and longitudinally intermediate the heads for sealably engaging the cylindrical wall when forced radially thereagainst,

portions of at least certain of the strips which are not covered by the other sleeve having tabs struck therefrom for biting engagement with the cylindrical wall so as to anchor the packer with respect thereto.

4,892,145
WELL CASING CLEANING ASSEMBLY

Lawrence R. Stafford, 3905 Starwood La., Bakersfield, Calif. 93309

Filed May 8, 1989, Ser. No. 348,905
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—171 5 Claims

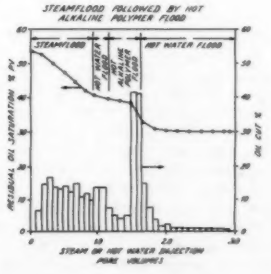


1. A well casing cleaning assembly, comprising:
a cylindrical mandrel including a plurality of diametric drillings extending thereacross said drillings being aligned at incremental azimuth displacements relative each other to form a spiral alignment;
a corresponding plurality of knife blade assemblies received in said drillings each said knife blade assembly including a coiled spring and a first and second knife blade extending from a base cap at one end thereof, said base caps abutting the ends of said coiled spring;
a plurality of arcuate plate segments engageable to the exterior of said mandrel said arcuate plate segments including slots formed therein in alignment over said drillings for receiving corresponding ones of said knife blades therethrough;
an upper and a lower packing attached to the ends of said mandrel and conformed for receipt in said well casing.

4,892,146
ALKALINE POLYMER HOT WATER OIL RECOVERY PROCESS

Chin W. Shen, Houston, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,092
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—270 17 Claims


STEAMFLOOD FOLLOWED BY HOT ALKALINE POLYMER FLOOD
STEAMFLOOD
HOT WATER FLOOD
HOT WATER FLOOD
ALKALINE POLYMER FLOOD
RESIDUAL OIL SATURATION % PV
OIL CUT %
STEAM OR HOT WATER INJECTION PORE VOLUMES

1. A method of recovering petroleum from a subterranean, petroleum-containing, permeable formation penetrated by an injection well and a producing well comprising
(a) introducing into the formation via the injection well a predetermined quantity of steam having quality of from 0.0 to 99.0 weight percent, said stream entering and sweeping petroleum from a portion of the formation and displacing petroleum toward the producing well;
(b) recovering petroleum together with the injected fluids from the formation via the producing well; and thereafter
(c) injecting a liquid phase displacing fluid into the same portion of the formation as was swept by steam, said liquid containing a viscosifying amount of a hydrophillic polymer, from 0.005 to 2.0 percent by weight of an alkalinity agent and from 0.01 to 5.0 percent by weight of an alkalinity-stabilizing agent selected from the group consisting of sodium carbonate, sodium bicarbonate and mixtures thereof, said liquid phase displacing fluid displacing petroleum through the formation to the production well; and
(d) recovering petroleum via the producing well.

4,892,147
HYDRAULIC FRACTURING UTILIZING A REFRACTORY PROPPANT

Alfred R. Jennings, Jr., and Lawrence R. Stowe, both of Plano, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

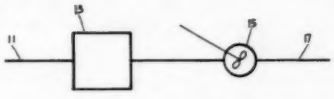
Filed Dec. 28, 1987, Ser. No. 138,174
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[4] E21B *43/267, 43/24*
U.S. Cl. 166—280 13 Claims

1. A method for hydraulically fracturing a formation where a fused refractory proppant is used comprising:
(a) placing into a fracturing fluid a fused refractory proppant consisting essentially of silicon carbide or silicon nitride having a Mohs hardness of about 9 and in an amount sufficient to prop a created fracture where said proppant is substantially crush and acid resistant;
(b) injecting into the formation said fracturing fluid with said proppant therein under a pressure sufficient to fracture said formation; and
(c) fracturing said formation and thereafter causing said pressure to be released thereby propping at least one fracture which proppant provides for increased heat transfer into said formation.

4,892,148
USE OF CHLOROUS ACID IN OIL RECOVERY

James A. Mason, P.O. Box 605, Theodore, Ala. 36582

Filed Jun. 14, 1988, Ser. No. 206,604
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—305.1 18 Claims



1. In a process of oil recovery including the steps of injecting flooding waters into oil bearing subterranean formations by means of water injection wells in order to displace portions of the remaining oil therein, the improvement comprising flooding waters having therein an aqueous solution containing an effective antibacterial amount of a mixture of a salt of lactic acid and chlorous acid, wherein said aqueous solution is obtained by reacting lactic acid and sodium chlorite, wherein said reacting of said lactic acid and said sodium chlorite occurs off-site from said well prior to injection into said well, wherein thereafter said aqueous solution is delivered on-site to said well for injection, and wherein said aqueous solution is injected into said well.

4,892,149

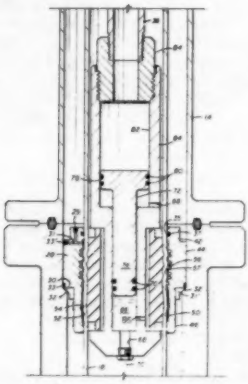
METHOD OF SECURING A TUBULAR MEMBER WITHIN AN ANNULAR WELL MEMBER, THE COMBINED WELL STRUCTURE AND THE TOOL

Larry M. Hoes, Spring; Thomas G. Cassity, Katy, and Steven D. Gullion, Houston, all of Tex., assignors to Cameron Iron Works USA, Inc., Houston, Tex.

Continuation of Ser. No. 44,409, Apr. 30, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 217,376

Int. Cl.[4] E21B *33/04*

U.S. Cl. 166—379 **9 Claims**



1. A method of securing a first annular member to a second annular member in a well including the steps of

positioning said members in the wall with one of said members being in surrounding relationship to the other of said members,

lowering a forming tool to a position within the inner of said members at a level at which such members are to be joined,

delivering fluid pressure to the forming tool at its position within the members and at a pressure sufficiently high to cause a portion of the inner member to be deformed by the forming tool radially outward into tight sealing and gripping engagement with the outer member,

relieving pressure delivered to the forming tool following completion of the deformation of the inner member,

delivering testing pressure to the outer of said members,

providing a seal between the two members at a position above the deformed portion of the inner member,

conducting testing pressure through the outer member to a position between said members above the deformed portion of the inner member and below the seal between the two members, and

detecting loss of test pressure delivered to said outer member.

4,892,150

POLYMER HORSESHOE PROVIDING ENHANCED SUPPORT

Owen E. Thoman, 20218 Viewcrest Dr., San Jose, Calif. 95120

Filed May 2, 1988, Ser. No. 189,315

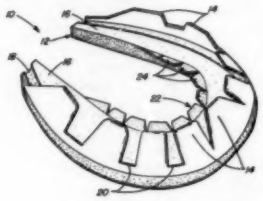
Int. Cl.[4] A01L *3/00, 5/00*

U.S. Cl. 168—4 **11 Claims**

1. A horseshoe comprising,

a flexible plastic shoe body having a hoof-engaging top surface and a bottom surface generally parallel to said top surface, said top surface having an arcuate force-bearing depression shaped and disposed to receive a keratinous portion of an animal hoof, said force-bearing depression extending along at least a majority of said shoe body, said force-bearing depression having a generally rectangular shape having sharp corners,

a plurality of securing tabs projecting upwardly from said shoe body for contact with an outer side wall of said horse hoof, said securing tabs forming an outer wall of said force-bearing depression,



a first bonding means for adhesively fixing said securing tabs to said outer side wall, and

a second bonding means for adhesively fixing said shoe body to said hoof.

4,892,151

BALLAST CLEANING MACHINE

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie GmbH, Vienna, Austria

Filed Oct. 1, 1984, Ser. No. 655,766

Claims priority, application Austria, Dec. 22, 1983, 4495/83

Int. Cl.[4] E01B *27/00*

U.S. Cl. 171—16 **10 Claims**

1. A track working machine adapted to receive, clean and convey bulk material, which comprises

(a) a chain mounted for excavating the bulk material and for conveying the excavated bulk material to a discharge end,

(b) a screening installation arranged to receive the excavated bulk material from the discharge end of the excavating and conveying chain, and to clean the received bulk material by separating waste from the bulk material, the screening installation comprising

(1) a supporting frame and

(2) two sets of a plurality of superposed vibratory screens extending obliquely with respect to the track in the direction of elongation of the machine, the sets of screens being arranged sequentially in, and symmetrically with respect to a vertical plane extending transversely to, said direction and having a common inlet area receiving the bulk material from the chain at a respective upper end of each set of screens, the two sets of screens having facing sides adjacent each other and the obliquely extending screens descending from the respective upper end whereby the screen; of the two sets enclose an angle, the bulk material flowing on the screens in said direction, and

(c) a conveyor band arrangement extending in said direction at least partially below the screening installation, the conveyor band arrangement comprising

(1) at least one conveyor band for receiving cleaned bulk material from the screening installation and

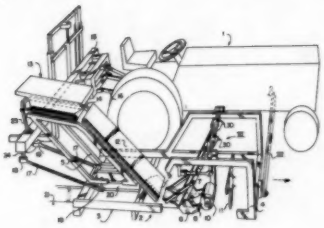
(2) at least one further conveyor band for receiving the waste from the screen installation.

4,892,152

CUTTING UNIT FOR CUTTING ONE OR MORE SODS

Johannes van Vuuren, Harmelerwaard 21, 3481 LC Harmelen, Netherlands

Filed Aug. 15, 1988, Ser. No. 232,165
Claims priority, application Netherlands, Aug. 14, 1987, 8701921
Int. Cl.[4] A01B 45/04
U.S. Cl. 172—20 9 Claims



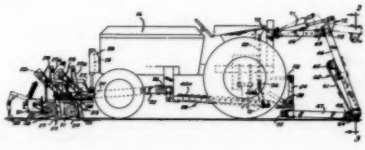
8. Apparatus for cutting sods comprising in combination, a powered vehicle movable over a ground surface in a forward direction, a first sub-frame supported by said vehicle, a cutting head supported by said first sub-frame, a second sub-frame supported by said vehicle, a conveyor supported by said second sub-frame for upwardly conveying sods, said first and second sub-frames being connected by bearing means disposed rearwardly of said cutting head and below said conveyor for supporting said first sub-frame for pivotal movement with respect to said second sub-frame about a pivot axis which extends substantially horizontal and parallel to the forward direction of movement of said vehicle so as to follow uneven terrain and/or slopes of a ground surface over which said vehicle travels.

4,892,153

SOD HARVESTER

Eugene D. Cooling, and Timothy M. Cooling, both of Rockford, Ill., assignors to Joe Cooling & Sons Inc., Rockford, Ill.

Filed Apr. 8, 1988, Ser. No. 179,476
Int. Cl.[4] A01B 45/04
U.S. Cl. 172—20 8 Claims



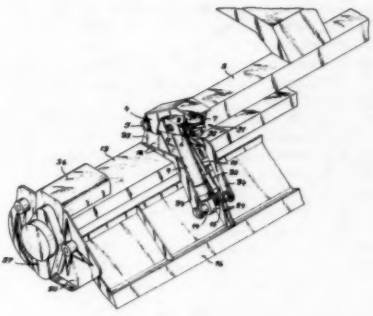
8. A sod harvester for cutting strips of sod from the ground, said harvester comprising a cutterhead adapted for attachment to a vehicle having a forward direction of travel, said cutterhead comprising a blade unit having a pair of transversely spaced side blades and having a bottom blade extending transversely between said side blades, means for moving the blade unit of said cutterhead back and forth to cause the blades thereof to cut the sod into a strip and to slice the strip from the ground during forward travel of the vehicle, and inclined pivot means supporting said cutterhead for pivoting relative to said vehicle about an axis which slants downwardly upon progressing forwardly and which is inclined relative to the ground at an angle of between 20 and 40 degrees.

4,892,154

GROUND-WORKING APPARATUS WITH ROTARY TILLER

Dietrich Ranner, Salzburg, Austria, assignor to Bombardier-Rotax-Wien Produktions- und Vertriebsgesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 827,272, Feb. 6, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 165,410
Claims priority, application Austria, Feb. 8, 1985, 374/85
Int. Cl.[4] A01B 33/02, 33/16
U.S. Cl. 172—72 6 Claims



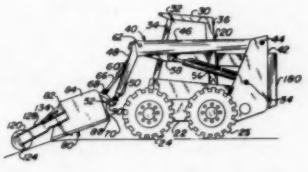
1. A ground-working implement which comprises:
a holder comprising a beam provided with means enabling attachment of said beam to a vehicle;
a rotary ground-loosening unit articulated to said beam and having a substantially horizontal axis extending transversely of a direction of travel of said implement; and
a smoothing board mounted on said beam behind said unit for leveling the ground loosened by said unit, said board being generally centrally subdivided into respective sections interconnected by a joint allowing pivotal movement of the smoothing board sections relative to one another, means being provided at a central location along said ground-loosening unit between sections of said ground-loosening unit to permit independent pivoting of said sections of said ground-loosening unit with respect to one another and to said beam.

4,892,155

LEVELING ATTACHMENT FOR A SKID-STEER VEHICLE

Richard B. Wanamaker, Rte. 1, Box 1 Parkview, Fort Stockton, Tex. 79735

Continuation of Ser. No. 967,057, Dec. 6, 1978, abandoned. This application Aug. 7, 1980, Ser. No. 175,830
Int. Cl.[4] A01B 35/18, 59/048
U.S. Cl. 172—199 7 Claims



1. Earth working apparatus comprising:
a nominally horizontally-oriented rigid support frame;
a generally vertically-oriented elongated scraper blade, mounted laterally across a forward end of said support

frame in a position for primarily working the earth, having a correspondingly laterally elongated cutting edge rigidly disposed below said support frame and with said blade and cutting edge oriented in a direction to cut and collect the earth when said frame is moved rearwardly;

a roller;

a bracket assembly for mounting said roller rigidly from and forwardly of said support frame with said roller disposed permanently during use in a fixed position axially parallel to said blade;

a steerable motive vehicle having powered front and rear wheels;

holding means disposed immediately at the rear of said support frame and pivotally coupled to said vehicle for enabling vertical swinging of said support frame about the axis of said roller;

means mounted on said vehicle and coupled in juxtaposition to said holding means for swinging said support frame about said axis;

ram means, disposed vertically above said holding means, pivotally coupled at one end to said support frame and at the other end to said vehicle, for effecting an additional vertical swinging of said support frame relative to said vehicle;

and said support frame including means defining a region, to the rear of said blade and continuing to said vehicle, which is free of structure positionable in the path of said blade during rearward movement of said frame.

4,892,156

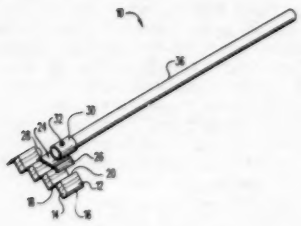
GARDEN TOOL

Walter C. Willis, Rte. 2 Box 255, Louisburg, N.C. 27549

Filed Jan. 31, 1989, Ser. No. 304,419

Int. Cl.[4] A01B *1/06*

U.S. Cl. 172—381 **14 Claims**



1. A garden tool, comprising:

an elongated handle;

means fixedly securing a cultivating blade adjacent one end of said handle;

said blade having a plurality of sequential adjacent connected teeth;

each of said teeth formed by a pair of generally perpendicular facets intersecting at a ridge line;

each of said pairs of facets forming each of said teeth being mirror symmetrical halves of a trapezoid;

each of said ridge lines extending generally parallel with said elongated handle;

and

a sharpened leading edge provided on each of said facets.

4,892,157

SEED METERING SHAFT ROTATION INDICATOR

LeRoy H. Gemar, 131 Riverview "B", Great Falls, Mont. 59404

Filed Sep. 9, 1988, Ser. No. 242,705

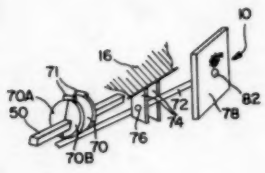
Int. Cl.[4] A01C *7/00*

U.S. Cl. 172—430 **3 Claims**

1. A seed metering shaft rotation indicator for use with a grain drill wherein the grain drill has a frame, multiple seed hoppers, and a rotatable seed metering shaft having an axis of rotation and extending through and between adjacent seed hoppers, the rotation indicator comprising:

a cylinder, having a longitudinal center line, the cylinder being frictionally mounted eccentrically on the seed metering shaft to rotate with the seed metering shaft, the longitudinal center line of the cylinder being positioned to be offset from, and parallel to, the axis of rotation of the seed metering shaft;

an indicator arm, having a first and second end, the arm



being hingedly mounted to the grain drill frame about an axis parallel to the axis of rotation of the seed metering shaft, with said first end positioned to abut and ride on the outside, longitudinal surface of the cylinder and the second end free to move in correspondence with movement of the first end;

a display means, mounted to the second end of the indicator arm, for providing a visual indication of arm movement;

whereby movement of the arm corresponds to movement of the seed metering shaft which movement is continuously indicated by the display means.

4,892,158

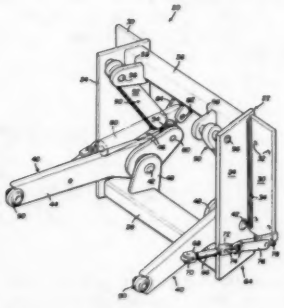
THREE POINT COUPLING ARRANGEMENT FOR A TRACTOR

Thomas R. Brown, Plainfield, Ill., and Daniel D. Morrow, Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Feb. 18, 1987, Ser. No. 16,150

Int. Cl.[4] A01B *59/043*

U.S. Cl. 172—443 **1 Claim**



1. A three point coupling arrangement for a tractor comprising a frame assembly, said frame assembly includes opposed side members, an upper cross member and a lower cross member, each of said cross members connected to said side members to form a generally rectangular frame, and side flange members connected to said side members, draft arms each pivotally supported to rotate about a first axis in spaced relation on said lower cross member intermediate the ends of said draft arms, fluid lift cylinders each having a cylinder portion pivotally supported on a pivot axis to rotate relative to said

upper cross member above a respective one of said draft arms and having a rod portion pivotally connected to a respective one of said draft arms at a location spaced forwardly of said first axis, a third connector pivotally supported on said upper cross member intermediate said lift cylinders, free rearward ends of said draft arms and said third connector providing a three point coupling, and a control means for operating said lift cylinders, said control means including fluid connector means providing fluid communication between the rod end of one of said lift cylinders and the head end of a second one of said lift cylinders interconnecting said cylinders in series to permit operation of said lift cylinders in unison, the area of said rod end of said one cylinder being substantially equal to the area of said head end of said second cylinder, said control means operating said cylinders in unison to lift said rearward draft arm ends as said lift cylinders are extended and lower said rearward draft arm ends as said lift cylinders are retracted;

wherein said draft arms are angularly related, each of said arms extending rearwardly from said lower cross member radially outwardly from the longitudinal axis of said frame assembly, said first axes being transverse pivot axes supporting said draft arms on said lower cross member and said pivot axes of said lift cylinder portions being spaced above and parallel to said draft arm pivot axes and perpendicular to said draft arms;

wherein said opposed side members are angularly related, each said side member extending generally parallel to the adjacent one of said draft arms, said draft arms and said lift cylinders pivotally supported to said side members; and

wherein said control means further includes a lift valve means in fluid communication with the head end of said one lift cylinder and the rod end of said second cylinder, and a tilt valve means in fluid communication with the rod and head ends of a selected one of said lift cylinders, whereby said selected lift cylinder may be operated by said tilt valve means to adjust the relative positions of said lift cylinders with respect to each other and said lift cylinders may be operated in unison by said lift valve means, and a valve restrictor connected to said tilt valve means for limiting the flow of fluid to said tilt valve means when said lift cylinders are operated in unison and said valve restrictor limiting the speed of extension or retraction of said selected lift cylinder when said tilt valve means is operated.

4,892,159

KERF-CUTTING APPARATUS AND METHOD FOR IMPROVED DRILLING RATES

Jesse L. Holster, Spring, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 29, 1988, Ser. No. 277,166
Int. Cl.[4] E21B *7/18*
U.S. Cl. 175—336 **35 Claims**

1. A drill bit comprising:

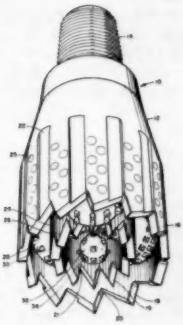
(a) a bit body having an upper end and a lower end, said lower end forming an annular cutter for cutting an outer annular kerf on rotation of the drill bit;

(b) an inner drill member positioned concentrically within said bit body having an upper end connected to said bit body and a lower end forming an annular cutter for cutting an inner annular kerf positioned concentrically within the outer annular kerf on rotation of the drill bit;

(c) a first plurality of rotary drilling members attachedly arranged between said bit body and inner drill member for rotation relative to said bit body and inner drill member, having lowermost cutting edges positioned above lowermost cutting edges of the annular cutter of said bit body and inner drill member to remove material between the outer and inner annular kerfs;

(d) a second plurality of rotary drilling members attachedly arranged within said inner drill member for rotation relative to said inner drill member, having lowermost cutting edges positioned above lowermost cutting edges of the annular cutter of said inner drill member to remove material surrounded by the inner annular kerf;

(e) a drilling fluid conduit disposed within said drill bit for delivering drilling fluid to said annular cutters and said



first and second plurality of rotary drilling members, said conduit separately discharging fluid to said first and second plurality of rotary drilling members; and

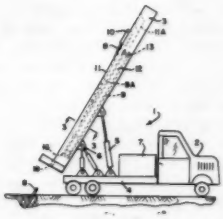
(f) means for connecting the upper ends of said bit body and drilling fluid conduit to a string of drill pipe.

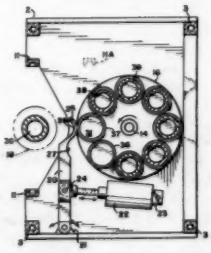
4,892,160

DRILL PIPE TRANSFER ARM FOR ANGLE DRILLING

George P. Schivley, Jr., Richardson, and Calvin J. Moore, Jr., Dallas, both of Tex., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 199,718, May 27, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 366,298
Int. Cl.[4] E21B *19/00*
U.S. Cl. 175—85 **7 Claims**





1. A transfer arm for controlling and positioning the lower end of a drill pipe upon removal from a stored position in a

circular carousel to an aligned position with a drill string comprising:

a lever arm interspaced between said carousel and a drill string centerline having pipe support means at one end and a pivot means at its other end;

means for rotating said lever arm about said pivot means to traverse said pipe support means from a position where said drill pipe is stored in said carousel to a position in alignment with said drill string centerline;

said pipe support means having a cylindrical pipe segment in an orientation such that it is substantially open toward said drill string and substantially closed toward said carousel; and

said lever arm including a recessed means spaced apart from and radially inward and opposite opening to said support means to accommodate close quarter drill storage in loading and unloading said carousel.

4,892,161

ROTARY ROCK DRILLING MACHINE

Wolfgang Ebeling, Hanover, Fed. Rep. of Germany, assignor to Turmag Turbo-Maschinen-AG Nüssel & Gräfer, Sprockhövel, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,385

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743706

Int. Cl.[4] E21B *17/046, 19/16;* **E21C** *1/00, 11/00*

U.S. Cl. 175—195 **28 Claims**

1. A rotary rock drilling machine, comprising a carriage having two ends; a rotary drilling drive arranged longitudinally displaceable on said carriage; a guiding head arranged on one end of said carriage, said guiding head and said rotary drilling drive defining a longitudinal axis of the machine; a drilling rod composed of a plurality of drilling rod parts which are releasably connected with one another, said drilling rod parts having a plurality of screw convolutions, said drilling rod parts having one end having a coupling pin with a snap pin and another end having a coupling bush with an engaging opening for said snap pin; a positioning device in said guiding head arranged to arrest a rotary position of said drilling rod; and an unlocking device for said snap pin, said positioning device including a locking bar which extends substantially parallel to said longitudinal axis and displaceable radially to said drilling rod, and which is insertable in at least one radial slot provided in said screw convolution of said drilling rod.

4,892,162

MAILING MACHINE

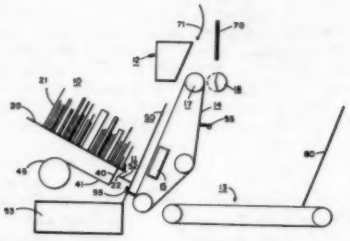
Donald T. Dolan, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 134,136, Dec. 17, 1987. This application Mar. 9, 1989, Ser. No. 321,043

Int. Cl.[4] G01G *23/22, 19/00*

U.S. Cl. 177—25.15 **15 Claims**

1. In a mailing machine including a mail processing device, and a package or envelope feeder for feeding packages to said mail processing device, the improvement wherein said envelope feeder comprises a support for holding a stack of substantially vertically oriented packages or envelopes, and further comprising means for separately sequentially feeding envelopes from said support to said mail processing device, said mailing machine further comprising means for sequentially feeding said envelopes upwardly from said processing device, said processing device comprising easel means for receiving



said envelopes, and weighing means for weighing envelopes on said easel.

4,892,163

WEIGHING DEVICE FOR STRAIN GAUGES

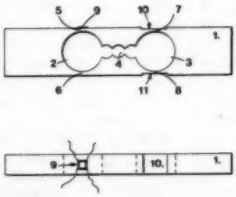
Jean-Pierre Aumard, Annemasse, France, assignor to Scaime, Annemasse, France

Filed Apr. 6, 1989, Ser. No. 334,702

Claims priority, application Switzerland, Apr. 12, 1988, 1341

Int. Cl.[4] G01G *3/14;* **G01L** *25/00, 1/22*

U.S. Cl. 177—211 **3 Claims**



1. A weighing device with strain gauges comprising a metal rod (1) designed to be constrained at one end and to receive a load supporting tray at the other end, provided with through holes (2, 3) at certain locations along its length defining in said rod weakened portions (5, 6, 7, 8) to provide hinges, said holes being connected together by a hollow portion (4), characterized in that it comprises a multiple strain gauge (9) fixed on the rod (1) at one of said weakened portions (5, 6, 7, 8) and in that the rod (1) has notches (10, 11) at a right angle with certain other weakened areas (7, 8), thereby displacing their neutral axis, said notches being calibrated to correct the inaccuracy observed when the load is offset, due to the gauges being formed as a single compact assembly at one location on the rod (1).

4,892,164

FRAME AND BODY CONSTRUCTION FOR SMALL SNOWMOBILE

Toshihiro Yasui; Masanori Sugita, and Tsuneo Isobe, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 2, 1988, Ser. No. 163,389

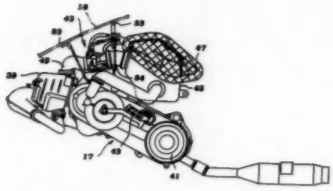
Claims priority, application Japan, Mar. 4, 1987, 62-49058

Int. Cl.[4] B60K *13/02*

U.S. Cl. 180—68.3 **5 Claims**

1. A small snowmobile or the like comprising a generally open welded, tubular frame assembly, an engine supported in said frame assembly and having an induction system including

a charge forming device, a body having a generally inverted cup shape affixed to said frame assembly and overlying said engine, said body having a substantially open lower area facing said frame assembly and said engine for facilitating assembly onto said frame assembly and whereby the underside of said



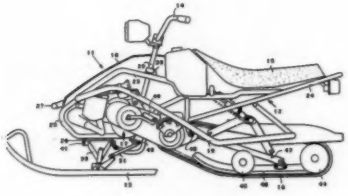
engine is substantially exposed to the elements when said body is affixed to said frame assembly, and a charge forming device enclosure fixed to said engine and cooperating with said body for enclosing said charge forming device for insulation of said charge forming device from the elements.

4,892,165

FRAME CONSTRUCTION FOR SMALL SNOWMOBILE

Toshihiro Yasui, and Masanori Sugita, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 1, 1988, Ser. No. 162,733
Int. Cl.[4] B62M *27/00*
U.S. Cl. 180—190 **7 Claims**



1. A snowmobile construction comprised of a frame assembly, said frame assembly comprising a plurality of interconnected tubular members defining a generally open, light weight construction, said frame defining a generally open engine area adapted to contain and support a driving engine, said frame further having a rearwardly extending portion adapted to accommodate and suspend a driving track driven by the engine, said frame assembly further providing mounting means for mounting a body and a body carried said mounting means in overlying relationship to only the forward portion of said frame assembly and closing only the upper part of said open engine area, and a seat for a rider mounted directly on said frame assembly and behind and independently of said body.

4,892,166

MOTORIZED WHEELCHAIR ASSEMBLY HAVING COUPLING DEVICE

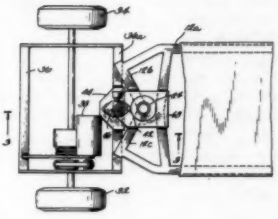
Edward J. Gaffney, N26 W27293 Hwy. SS, Pewaukee, Wis. 53072

Filed May 3, 1988, Ser. No. 189,534
Int. Cl.[4] B62D *61/00*
U.S. Cl. 180—208 **8 Claims**

1. A device for coupling a front wheel unit of a wheelchair including a wheel and means for steering the wheel, with a rear wheel unit of the wheelchair including a frame and a wheel rotatably connected to said frame, said coupling device comprising:

a connector portion at a front end of said frame, which connector portion is generally vertically oriented but inclined forward slightly,

said front wheel unit having ata rear end thereof a connector portion which is generally vertically oriented but inclined forward approximately the same as the rear wheel unit



connector portion, said front wheel unit connector portion being sized and positioned so as to telescopically interfit with said connector portion of said rear wheel unit,

said connector portions having four sides of substantially equal size such that said portions are substantially square in cross-section,

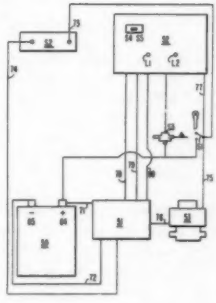
a diagonal of said square cross-section of said connector portions being oriented generally parallel to the front-to-rear direction of the wheelchair.

4,892,167

AUTOMATIC ELECTRONIC AND MECHANICAL SYSTEM TO AVOID VEHICLE THEFT

Jose O. V. Tejeda, Juan de la Barrera 33, Circ. Heroes, Cd. Satelite, C.P. 53100, Edo. de Mexico, Mexico

Filed Apr. 28, 1988, Ser. No. 187,476
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] B60R *25/00*; B62H *5/00*
U.S. Cl. 180—287 **1 Claim**



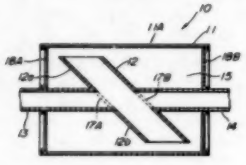
1. An automatic vehicle anti-theft system having an antitheft mode and an anti-hijack mode, for a vehicle having both an ignition switch S1 and an open door switch S 3 for a door, comprising in combination:

(a) an electrically controlled fuel supply system 53 supplied with switched electrical current by said ignition switch S 1;

(b) a momentary switch S2 supplied with switched electrical current by said ignition switch S1;

(c) an electronic valve between said electrically controlled fuel supply system 53 and the ground;
(d) said electronic valve normally closed and opened by a voltage applied to its gate and remaining open thereafter;
(e) said momentary switch S2 supplying a voltage to the gate of said electronic valve to open said electronic valve whenever said ignition switch is on;
(f) said electronic valve operating a delay module which turns off the fuel pump after a preset interval;
(g) said open door switch S3 open when the door is closed and closed when the door is open;
(h) said open door switch S3 controlling said electronic valve to close said electronic valve when said open door switch S3 is closed;
(i) an open door override switch S4 to selectively disable said anti-hijack mode; and
(j) a valet parking override switch S5 to selectively disable the anti-theft mode while the vehicle is in the valet mode;
Whereby said automatic vehicle anti-theft system permits the owner of said vehicle to disable either of two protection modes.

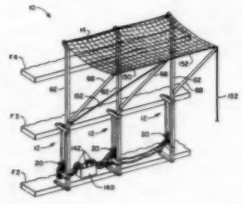
4,892,168
NOISE ATTENUATING DEVICE
Akira Sasaki, and Yuichi Sakuma, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 20, 1988, Ser. No. 286,750
Claims priority, application Japan, Dec. 22, 1987, 62-194282; Apr. 26, 1988, 63-103566
Int. Cl.[4] F01N *1/02*
U.S. Cl. 181—250 **11 Claims**



1. A noise attenuating device comprising:
a main body defining therein a resonance chamber;
a gas inlet tube extending to the inside of said main body so that gas is introduced through said inlet tube into the inside of said main body;
a gas outlet tube extending to the inside of said main body so that gas inside said main body is discharged through said outlet tube to the outside of said main body; and
a tuning tube to which said inlet and outlet tubes are connected, said tuning tube being located between said inlet and outlet tubes so that gas from said inlet tube flows through said tuning tube into said outlet tube, said tuning tube being opened to the resonance chamber so as to establish gas communication between the inside of said tuning tube and the resonance chamber, the cross-sectional area defined by the inner periphery of said tuning tube being larger than that of said inlet tube and that of said outlet tube.

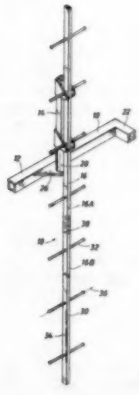
4,892,169
PERIMETER DEBRIS NET LIFTING SYSTEM
Charles W. Duncan, Costa Mesa, Calif., assignor to Sinco, Inc., East Hampton, Conn.
Filed Feb. 21, 1989, Ser. No. 313,089
Int. Cl.[4] E04G *21/30, 21/32*
U.S. Cl. 182—138 **32 Claims**

29. A debris net lifting system for climbing a series of vertically spaced platforms comprising:
a plurality of laterally spaced lifting units anchorable to said platforms;
a debris net suspended from said lifting units so as to extend generally laterally and outwardly from said platforms at a first pre-selected vertical height;
each said lifting unit comprising:
first frame means comprising inner upper and inner lower attachment means for independent mounting to respective spaced platforms;
second frame means slidably coupled to said first frame



means comprising outer upper and outer lower attachment means for independent mounting to respective spaced platforms, said second frame means comprising suspension means for suspending said debris net;
so that one said frame means may be vertically displaced from said first height to a second vertical height while the other said frame means is mounted in fixed relationship to selected platforms with the debris net being suspended from said unit and supported on said selected platforms during the vertical displacement of said one frame means.

4,892,170
PORTABLE LADDER ASSEMBLY
William P. O'Donnell, Nassau Bay, Tex., assignor to Avanti International, Webster, Tex.
Filed Apr. 27, 1989, Ser. No. 344,060
Int. Cl.[4] B65D *90/10*; E06C *1/36*
U.S. Cl. 182—100 **20 Claims**



1. A portable ladder assembly for providing access to a manhole having a central axis and extending downward from a support surface, the ladder assembly comprising:
a base member including first and second arms positionable on radially opposite sides of the central axis of the opened

manhole, each of the first and second arms having a portion adapted for engagement with the support surface to prevent the ladder assembly from tipping;

a ladder including a single elongate rail having a central rail axis and a plurality of rungs fixed to and extending in opposite directions outwardly from the rail, each rung extending outwardly from the rail along a rung axis substantially perpendicular to the central axis of the rail; and

a supporting bracket secured to the base member and having a rail receiving slot and a plurality of vertically spaced and downwardly directed rung receiving slots on opposing sides of the rail receiving slot, such that the ladder may be supported at a selected depth within the manhole by fitting the rail within the rail receiving slot and fitting a selected pair of rungs within their respective rung receiving slots.

4,892,171

ADAPTER FOR USE WITH A LUBRICATION FITTING

Christian T. Scheindel, Star Route Ridge Rd., Randolph Center, Vt. 05061

Filed Sep. 12, 1988, Ser. No. 242,641
Int. Cl.[4] F01M *11/04*
U.S. Cl. 184—105.3 **12 Claims**

1. An adapter for use with a lubrication fitting of the type which includes a flow restrictor normally biased to a closed position to restrict the flow of fluid, the adapter comprising a generally tubular body having a top end and a bottom end, said top end of said tubular body being shaped and dimensioned to removably receive the output port of said lubrication fitting and a pin centrally positioned in said tubular body proximate said top end thereof, said pin being adapted to enter an opening of said lubrication fitting to move said flow restrictor from its normally closed position to an open position in which fluid can flow characterized in that the diameter of said pin (3) is smaller than the diameter of the opening of said lubrication fitting (10), and in that said pin is fixed to a separating disc (2) which is secured in a fixed position to said tubular body (1) and is provided with a plurality of openings (4) for allowing said fluid to flow into said lubrication fitting.

4,892,172

SHAFT LOCK ASSEMBLY

James C. Hobson, Traverse City, Mich., assignor to Cadillac Gage Textron Inc., Warren, Mich.

Filed Nov. 23, 1988, Ser. No. 275,517
Int. Cl.[4] F16D *65/32*
U.S. Cl. 188—69 **11 Claims**

1. A rotary lock assembly for securing a driven shaft while under a drive force and for releasing the driven shaft without interfering with its acceleration the combination of:

a lock assembly stator;

means for fixedly securing said stator against rotation;

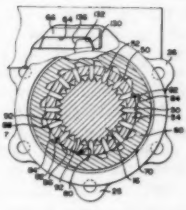
a driven shaft having an end extension thereon located within said stator;

means defining a plurality of guide slots in said stator at circumferentially spaced points therearound;

a lock vane in each of said guide slots having an inboard end and an outboard end;

coacting means on said shaft extension engageable with said vanes to hold said driven shaft against rotation; and

lift means for lifting each of said vanes from engagement with said shaft extension without impeding acceleration of said shaft and said lift means mechanically holding each of said vanes in a released position to prevent engagement of said tapered surfaces with the accelerated shaft;



said lift means including a cam ring and a pair of laterally spaced scroll cams;

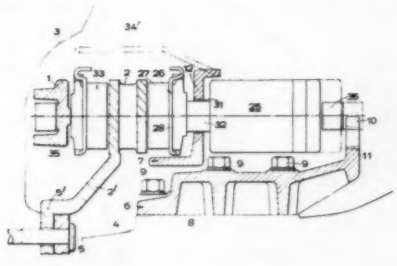
each of said scroll cams having means thereon engageable with said vanes and operative to move said vanes into a released position with respect to said shaft extension.

4,892,173

DISC BRAKES IN VEHICLES

Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries Public Limited Co., Birmingham, United Kingdom

Continuation of Ser. No. 27,785, Mar. 19, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 268,663
Claims priority, application United Kingdom, Mar. 27, 1986, 8607760
Int. Cl.[4] F16D *55/224, 65/20*
U.S. Cl. 188—73.44 **17 Claims**



1. A disc brake for a vehicle comprising a disc having an inboard side and outboard side and being rotatable with an axle shaft which is rotatably mounted in an axle casing and which has a wheel-mounting flange by means of which a wheel is mounted on said axle shaft, the wheel-mounting flange having an inboard side, an outboard side, and an outer peripheral edge; a wheel mounted on said wheel-mounting flange on said axle shaft; inboard and outboard friction pad assemblies for engagement with opposite faces of said disc; a caliper assembly; an actuator incorporated in said caliper assembly for applying said friction pad assemblies to said disc; a bracket for mounting said caliper assembly on said axle casing; means detachable mounting said bracket on said axle casing on said inboard side of said disc, said bracket having a radial flange projecting radially outwards to locate said caliper assembly and having a peripheral edge, and said radial flange of said bracket incorporating a rigid diaphragm which extends between said actuator of said caliper assembly and the inboard friction pad assembly,

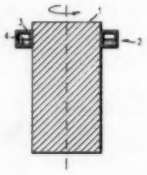
said diaphragm being provided with at least on opening through which a brake-applying force from said caliper assembly can be transmitted to said inboard pad assembly, said radial flange of said bracket also having relatively thin axially extending flanges which are disposed between said inboard pad assembly and said axle shaft and which extend circumferentially around the periphery of one end of said actuator substantially to surround that end of said actuator so as to form a housing in which said actuator is received, and wherein said caliper assembly and said bracket lie substantially outside said outer peripheral edge of said wheel-mounting flange, and wherein said disc has a first, radially inner, part which is outboard of said wheel-mounting flange, and a second, radially outer, part which is inboard of said wheel mounting flange, no portion of said second part being within the plan projection of said outer peripheral edge of said wheel-mounting flange as viewed along said central axis of said axle shaft so that after removing the wheel from said wheel-mounting flange and detaching said bracket from said axle casing, said disc and said caliper assembly can be withdrawn from said axle shaft in a single direction parallel to said central axis.

4,892,174

NUTATION DAMPER FOR A HIGH-SPEED SPINNING BODY

Shigeru Takekado, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 26,195, Mar. 16, 1987, abandoned. This application Jul. 21, 1988, Ser. No. 222,288
Claims priority, application Japan, Mar. 20, 1986, 61-63216
Int. Cl.[4] F16F *15/16*
U.S. Cl. 188—378 **9 Claims**



1. A nutation damper for a high-speed spinning body comprising:

a hollow ring-shaped container installed concentrically to the axis of spin of a high-speed spinning body and rotating therewith, and

a viscous liquid fluid sealed inside, and partially filling, the container so as to leave a gap, said viscous fluid having a volume which is determined as less than or equal to ½ of the volume enclosed by the outer wall of said container, said container containing only said viscous liquid fluid, except for said gap.

wherein said viscous fluid has a viscosity of more than or equal to 1.0 cSt with little fluctuation of viscosity with temperature and is one from the group consisting of a silicone oil and a fluorinated oil,

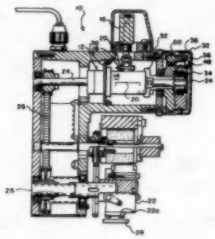
whereby a circumferential wave is formed in said viscous fluid during rotation of said spinning body and nutation energy is damped by said centrifugal wave when the centrifugal wave frequency matches the nutation frequency.

4,892,175

WRAP SPRING CLUTCH/BRAKE APPARATUS WITH HELPER CLUTCH MECHANISM

Donald Van Erden, Wildwood, and Donald Noren, Glenview, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Nov. 2, 1988, Ser. No. 265,957
Int. Cl.[4] F16D *67/02*
U.S. Cl. 192—12 BA **14 Claims**



1. In a wrap spring clutch/brake apparatus of the type having a constantly rotating hub input, a clutch shaft output, a stationary brake hub, a clutch spring and a brake spring, said clutch spring being wrapped down for positively engaging the hub input and the shaft output, said brake spring being wrapped down for engaging the shaft output and the brake hub, a load being drivingly coupled to the shaft output, wherein the improvement comprises a clutch mechanism for supplying increased frictional torque at lower rotational speeds to the load, comprising:

said clutch mechanism being operatively coupled to said hub input and including an inner cylindrical-shaped member attached to the shaft output, an outer annular member disposed concentrically around said inner cylindrical-shaped member, and a garter spring disposed concentrically around said outer annular member;

said outer annular member being formed of a plurality of identical-shaped sigmented fly-weights, each segmented fly-weight having an inner arcuate section and an outer arcuate section disposed in a spaced apart relationship from said inner arcuate section by an intermediate section; and

said inner arcuate section of said segmented fly-weights being disposed to be frictionally engaged with the circumference of said inner cylindrical-shaped member at lower rotational speeds to add increased frictional torque to said shaft output and being adapted for radial movement away from the frictional engagement with the inner member at relatively high rotational speeds.

4,892,176

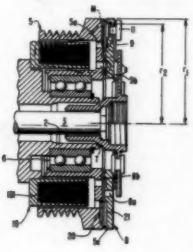
ELECTROMAGNETIC CLUTCH HAVING HIGH TORQUE TRANSFER

Matsushita Takashi, Isesaki, and Uehara Fumiaki, Takasaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Sep. 8, 1987, Ser. No. 93,697
Claims priority, application Japan, Sep. 5, 1986, 61-135595[U]; Sep. 5, 1986, 61-135596[U]
Int. Cl.[4] F16D *27/10*
U.S. Cl. 192—84 C **2 Claims**

1. In an electromagnetic clutch including a first rotatable member rotatably supported on a first bearing, said first rotatable member having an axial magnetic end plate with at least one arcuate slit, a second rotatable member rotatably supported on a second bearing, an annular magnetic member supported on said second rotatable member in a manner which permits limited axial movement of said annular magnetic mem-

ber, said annular magnetic member facing said axial magnetic end plate of said first rotatable member with an axial gap therebetween, and electromagnetic means associated with said first rotatable member for attracting said annular magnetic member supported on said second rotatable member, the improvement comprising:



a first annular groove formed in said axial magnetic end plate, an outer edge of said first annular groove adjacent an outer surface of said first rotatable member and an inner edge of said first annular groove adjacent said at least one arcuate slit; and

a second annular groove formed in said annular magnetic member opposite said first annular groove.

4,892,177

FRICTION CLUTCH WITH TWO FRICTION DISCS, AND A CLUTCH ASSEMBLY INCLUDING SUCH A CLUTCH

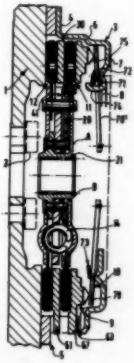
Ernesto Lanzarini, Moncalieri, and Bruno Boero, Dusino S.Michele, both of Italy, assignors to Valeo, Paris, France

Filed Mar. 6, 1989, Ser. No. 320,234

Claims priority, application France, Mar. 9, 1988, 88 03023

Int. Cl.[4] F16D *13/00, 3/14, 13/68, 47/02*

U.S. Cl. 192—106.2 **6 Claims**



1. A friction clutch, particularly for a sports car, comprising a first part and a second part, means mounting said first and second parts for their rotation relative to each other, said means including circumferentially acting resilient means, said first part comprising a first carrier plate, a second carrier plate, and spacer means coupling the said carrier plates together at a fixed axial spacing, said second part comprising a damper plate disposed axially between the carrier plates, said first part further comprising a first friction disc and a second friction disc, said first friction disc comprising a support plate having through openings, the spacer means extending through said openings whereby the said support plate is axially movable with respect to said first carrier plate, the friction clutch further including coupling means coupling the support plate to said first carrier plate, and being characterised in that the support plate of said first friction disc is disposed axially between said first and second carrier plates.

4,892,178

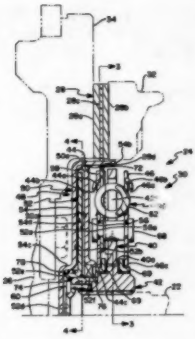
VISCOUS DAMPER MODULE FOR TORSIONAL VIBRATION DAMPING MECHANISM

Gerald D. Damon, Farmington, and Robert S. Mueller, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1987, Ser. No. 87,586

Int. Cl.[4] F16D *3/66, 47/06*

U.S. Cl. 192—106.2 **15 Claims**



1. A torsional vibration damping mechanism in a free standing clutch plate assembly adapted to be rotationally interposed in a driveline between an output drive of a prime mover and an input drive of a transmission; the mechanism comprising:

first and second assemblies disposed for relative rotation about a common axis, the first assembly including first and second radially extending, axially spaced apart wall members secured together and adapted for driving connection to the prime mover drive, the second assembly including annular hub means adapted for connection to the transmission input drive, and bearing means for journaling a radially inner extent of at least one of the wall members on the hub means;

an intermediate means including a radially extending member disposed between the first and second wall members, the member of the intermediate means drivingly connected to and extending radially outward of the hub means;

a spring set disposed between radially inner and outer extends of the wall members, the spring set comprising a plurality of helical compression springs of relatively high spring rate circumferentially spaced apart and resiliently interconnecting the wall members with the intermediate means member, the springs being flexibly operative to attenuate torsionals when the driveline is connected to a load;

a friction assembly including first and second axially facing friction surfaces respectively defined on opposite sides of a radially extending flange, the friction surfaces disposed radially outward of the radially outer extent of the wall members, a radially inner portion of the flange fixed to the first assembly, and the friction surfaces adapted to be frictionally clamped between pressure plates of an engagement mechanism defining said input drive; the improvement comprising:

a viscous shear damper module disposed axially adjacent the first assembly, said damper module including annular

housing and clutch assemblies mounted for relative rotation, the housing assembly having first and second axially spaced apart sidewalls defining a chamber containing a viscous shear liquid with at least one of said sidewalls having an interior surface defining a first clutching surface, said clutch assembly being drivingly connected to one of said means and having a radially extending portion thereof disposed in said chamber, said portion defining a second clutching surface closely spaced from said first clutching surface and in viscous clutching coaction therewith via said viscous shear liquid; and

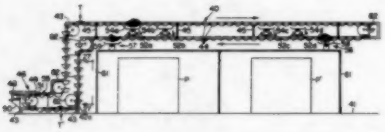
axially extending means fixing a radially outer portion of the annular housing assembly for rotation with the first assembly at positions radially outward of the spring set and radially inward of the axially facing friction surfaces.

4,892,179

BUCKET DISTRIBUTION SYSTEM

Jimmie F. Lassiter, Jr., and David R. Slager, both of San Antonio, Tex., assignors to Meyer Machine Company, San Antonio, Tex.

Filed Aug. 11, 1988, Ser. No. 231,720
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—365 **7 Claims**



1. Apparatus for distributing products from an infeed station to a plurality of distribution stations, comprising:

means for transporting a plurality of buckets in a continuous travel path, each of said buckets being adapted to receive a first predetermined portion of said products comprising a first amount of said products and a second predetermined portion comprising a second amount of said products in addition to said first amount;

primary bucket trip means for pivoting selected ones of said buckets at each of said distribution stations to thereby discharge products within said buckets; and

secondary bucket trip means for pivoting each of said buckets at an outlet station, said secondary bucket trip means being adapted to pivot said buckets so as to discharge products only from said buckets having said first and second portions of products therein, said secondary bucket trip means being further adapted to discharge only an amount of said products approximately equivalent to said second amount of said products.

4,892,180

METHOD AND APPARATUS FOR EXTRACTING INDIVIDUAL PARTS FROM A CONVEYOR

Walter Sticht, Karl-Heinrich-Waggerl-Strasse 8, A-4800 Attnang-Puchheim, Austria

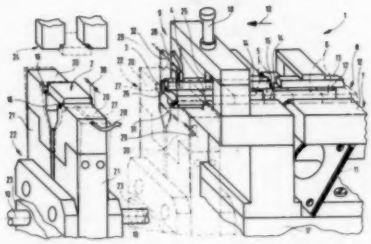
Continuation-in-part of Ser. No. 804,291, Dec. 3, 1985, abandoned. This application May 26, 1987, Ser. No. 54,290
Claims priority, application Austria, Dec. 6, 1984, 3869/84
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—375 **23 Claims**

1. A method of feeding assembly parts to an extraction station and extracting successive ones of said assembly parts at said station, which comprises the steps of

(a) laterally and vertically guiding a succession of substantially identically dimensioned, rigid assembly parts at portions thereof in a guiding track for aligning the assembly parts and subjecting the aligned assembly parts in the guiding track to a conveying force to convey the aligned assembly parts in a conveying direction along the guiding track to a singling station defining an end of the guiding track,

(b) retaining a respective one of the aligned assembly parts immediately trailing a leading assembly part at a singling station,

(c) mechanically clamping the leading assembly part at the portions thereof which are laterally and vertically guided by the end of the guiding track, and



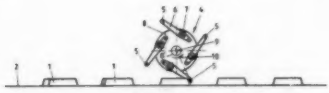
(d) moving the clamped, vertically and laterally guided assembly part in the conveying direction away from the retained assembly part to the extraction station whereby the leading assembly part is separated from the succession of assembly parts and is singled at the singling station while being vertically and laterally guided.

4,892,181

METHOD AND ARRANGEMENT FOR ORIENTING CANDIES

Wilhelm Hogenkamp, Hanover, Fed. Rep. of Germany, assignor to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,150
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3708881
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—434 **13 Claims**



1. A method for aligning elongated articles such as bars of chocolate or pastries on a conveyor, comprising the steps: transporting said articles with varying misalignments on a conveyor having a conveyor speed in a conveying direction, said articles being transported on said conveyor in spaced rows; measuring misalignment of each article upstream of said conveying direction; lowering an aligning retainer rod from a raised position to a position between two adjacent rows of said articles; transporting said retainer rod with said moving conveyor at a speed that is less than the speed of the conveyor, so that said articles abut said rod and are decelerated for a predetermined time interval only dependent on said measuring step; holding said retainer rod in abutment with an article for said time interval until misalignment of said article is zero, said time interval being sufficient for aligning the articles in a row and preventing thereafter disorientation of longitudinal axes of said articles.

4,892,182

DEVICE FOR THE ORDERLY REMOVAL OF OBJECTS FROM A CONTAINER

Bror Gustafsson, Gislaved, Sweden, assignor to Aktiebolaget Tetra Pak, Lund, Sweden

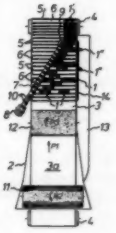
PCT No. PCT/SE86/00101, § 371 Date Sep. 7, 1988, § 102(e) Date Sep. 7, 1988, PCT Pub. No. WO87/05275, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 10, 1986, Ser. No. 252,369

Claims priority, application Sweden, Sep. 10, 1984, 8404517

Int. Cl.[4] B65G *47/12*

U.S. Cl. 198—454 7 Claims



1. Device for the orderly removal of elongated objects (1), such as plastic spoons, from a container (2) holding a disarray of such objects, said device having an endless conveyor belt (3) which is provided on its outer side with transverse ribs (5) extending throughout the entire width of the conveyor belt (3) and defining between -hem transverse grooves (6) having a width slightly exceeding the width of the objects (1), and which has an upper run (3*a*) inclined upwardly in the direction of travel (P1) and extending through the container (2) in order, in its transverse grooves (6), to receive and transport objects (1) resting on the bottom (6*a*) of the grooves formed on the conveyor belt (3), from the disarray of objects in the container (2), characterized by an endless shifting belt (7) having a lower run the plane of which is parallel to the plane of the upper run (3*a*) of the conveyor belt (3), and extending obliquely across the conveyor belt throughout a portion of its width and having projecting pins (10) adapted to engage in the transverse grooves (6) in the upper run (3*a*) of the conveyor belt (3) in order, during advance of the conveyor belt (3), to drive the shifting belt (7) and shift objects (1) received in the transverse grooves (6) in the upper run of the conveyor belt, laterally transversely of the direction of travel (P1) of the conveyor belt so as to place the objects straight behind one another at one end of the transverse grooves (6).

4,892,183

TAKE-OUT MECHANISM FOR A GLASS CONTAINER FORMING MACHINE

Frank A. Fenton, Granby, Conn., assignor to Emhart Industries, Inc., Hartford, Conn.

Filed Aug. 25, 1988, Ser. No. 236,494

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—468.3 2 Claims

1. A take-out mechanism for removing finished containers from a selected pick-up location at a molding station of a container forming machine and carrying the removed containers to and depositing the removed containers on a conveyor comprising:

first container gripping means including

a first gripper head, and

means for vertically displacing said first gripper head between selected elevated and lowered positions;

second container gripping means including

a second gripper head, and

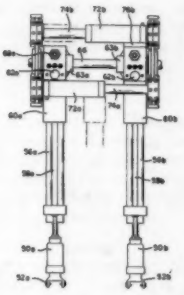
means for vertically displacing said second gripper head between selected elevated and lowered positions,

means for supporting said first and second container gripping means including

first and second spaced parallel rails for supporting said first and second container gripping means for horizontal displacement between advanced and retracted positions,

means for displacing said first and second container gripping means along said first and second rails between said advanced and retracted positions,

a third rail for supporting said first container gripping means for horizontal displacement in a direction transverse to said first and second rails from a retracted



position spaced from and on one side of the pick-up location to the pick-up location,

means for displacing said first container gripping means along said third rail between said retracted position and the pick-up location,

a fourth rail parallel to said third rail for supporting said second container gripping means for horizontal displacement from a retracted position spaced from and on the other side of the pick-up location to the pick-up location, and

means for displacing said second container gripping means along said fourth rail between said retracted position and the pick-up location.

4,892,184

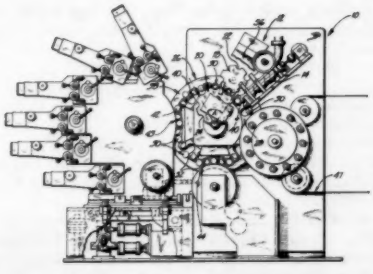
INFEED SYSTEM FOR CONTAINER DECORATING APPARATUS

Pieter S. vander Griendt, Bernardsville, N.J.; Robert W. Tielrooy, Amstelveen, Netherlands, and Edward J. Russell, Gladwin, Mich., assignors to Van Dam Machine Corporation, West Paterson, N.J.

Filed May 15, 1981, Ser. No. 263,809

Int. Cl.[4] B65G *47/84*

U.S. Cl. 198—476.1 7 Claims



1. An infeed transfer system for a continuously operated container decorating apparatus comprising:

A. a mandrel wheel assembly comprising:

a rotatable mandrel wheel,

a plurality of regularly spaced mandrel assemblies pivotally mounted on said mandrel wheel, and

a box cam guide means communicating with said mandrel assemblies at one end thereof, for guiding the path of movement of said mandrel assemblies during the rotation of said mandrel wheel; and

B. a pocket wheel defining a plurality of cradles for the reception and support of said containers, eccentrically mounted adjacent said mandrel wheel, wherein said pocket wheel has a diameter smaller than that of said mandrel wheel, and said cradles are fewer in number than said mandrel assemblies;

C. said box cam guide means defines a path causing each of said mandrel assemblies to follow the circumferential periphery of said pocket wheel in alignment therewith through an arc of rotation to facilitate the transfer of containers carried by said pocket wheel, to said mandrel assemblies;

D. wherein said smaller diameter pocket wheel simplifies the inspection and maintenance of said mandrel wheel assembly, by offering greater accessibility to said mandrel wheel and said mandrel assemblies, to effect repairs thereof and to remove misfed containers therefrom.

4,892,185

AUTOMATIC DISCHARGING TROUGH FOR USE IN A WEIGHING MACHINE

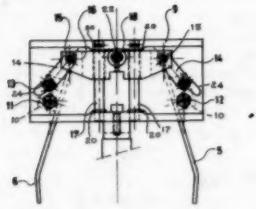
Agustin D. Guardiola, Barcelona, Spain, assignor to Talleres Daumar S.A., Barcelona, Spain

Filed Feb. 16, 1988, Ser. No. 156,286

Claims priority, application Spain, Feb. 27, 1987, 8700939

Int. Cl.[4] B65G *47/34*

U.S. Cl. 198—477.1 **14 Claims**



1. An automatic discharging trough for a weighing machine comprising:

a support piece including a C-shaped vertical section having upper and lower horizontal branches,

at least one substantially vertical rod fixed between the upper and lower horizontal branches of the C-shaped section,

a substantially vertical displaceable piece slidable along said at least one substantially vertical rod, said rod serving as a guide for said piece,

a first tilting side wall,

a first link hinged at one end thereof to said vertically displaceable piece, and attached at the other end thereof to said first tilting side wall,

a second tilting side wall, and

a second link hinged at one end thereof to said vertically displaceable piece, and attached at the other end thereof to said second tilting side wall,

end walls having fixed positions relative to said support piece, said side walls and said end walls in combination comprising at least a portion of the storage volume of said trough when said trough is closed,

substantially vertical movement of said substantially vertically displaceable piece in one direction along said at least one substantially vertical rod causes said side walls to move for closing said trough, and

substantially vertical movement of said substantially vertically displaceable piece in the opposite direction along said at least one substantially vertical rod causes said sidewalls to move apart for opening said trough, side displaceable piece being subject to movement by application of an external force.

4,892,186

CLOCK CONVEYOR PROVIDED WITH A PLURALITY OF ENTRAINMENT MEMBERS

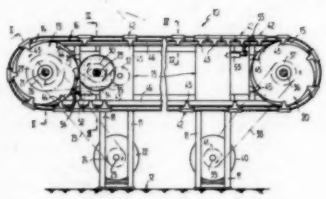
Hans Frei, Oetwil am See, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jan. 22, 1988, Ser. No. 147,274

Claims priority, application Canada, Jan. 26, 1987, 258/87

Int. Cl.[4] B65G *29/00*

U.S. Cl. 198—803.01 **20 Claims**



1. A clock conveyor comprising:

a plurality of entrainment members;

an endless revolvingly driven traction element at which there can be coupled said plurality of entrainment members wherein said endless revolvingly driven traction element comprises a belt member;

a release mechanism for individually summoning the entrainment members for coupling thereof with said endless revolvingly driven traction element;

at least one shuttle wheel for individually placing said entrainment members in succession and at a substantially uniform spacing from one another into a position such that said entrainment members can be coupled with the endless revolvingly driven traction element;

means for coupling each of said entrainment members with said endless revolvingly driven traction element;

said coupling means comprising magnetic means for force-lockingly coupling the entrainment members with the endless revolvingly driven traction element in order to thereby entrain and hold the entrainment members by said endless revolvingly driven traction element;

each of said entrainment members being operatively associated with said belt member when coupled therewith;

each of said entrainment members having a side confronting said belt member;

said side confronting said belt member of each entrainment member comprising at least one permanent magnet;

said belt member being provided with ferromagnetic elements; and

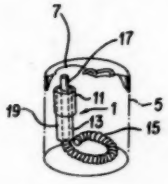
said at least one permanent magnet of each entrainment member and said ferromagnetic elements of said belt member constituting said magnetic means for force-lockingly entraining and holding said entrainment members at said endless revolving driven traction element.

4,892,187

DRINKING APPARATUS

Peter Stein, 1221 N. Courthouse Rd. 311, Arlington, Va. 22201

Continuation of Ser. No. 190,116, May 4, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 313,030
Int. Cl.[4] B65D *83/00*
U.S. Cl. 206—217 3 Claims



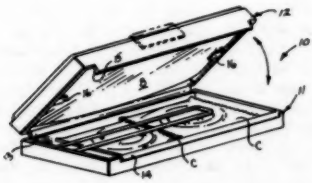
1. Drinking apparatus comprising a pop-up straw submerged in a beverage can, said straw including an upper end face, said can containing or including a strut, said can containing a beverage and connection means for connecting the straw to the strut and elevation means for emerging the upper portion of the straw upwardly and outward from the can when the can is opened, the beverage can having a fracture-and-press-in sealing tab on an upper end wall of the can for opening the can, the tab being moveable inwardly within the can, said upper end face of the straw being installed inside the can directly beneath the opening and beneath the tab.

4,892,188

SANITARY CONDOM CASE

Margaret A. Meadows, 1089 Highland Dr., St. Albans, W. Va. 25177

Filed Dec. 5, 1988, Ser. No. 279,509
Int. Cl.[4] B65D *85/14*
U.S. Cl. 206—223 6 Claims



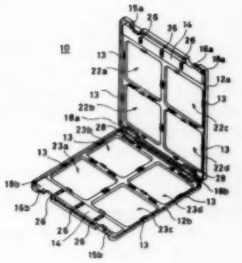
1. A condom case comprising, in combination,
a container defining a first cavity, and
a lid defining a second cavity in overlying relationship to said first cavity and pivotally secured to and overlying said container, and
fastening means for selectively securing said lid to said container, and
first clip means integrally secured within said first cavity of said container for securing at least one condom therein, and
second clip means integrally secured within said second cavity for securing a disposable bag therein, and
further including a dispensing compartment integrally secured to a top portion of said lid wherein said dispensing compartment includes an access opening means for providing access to a plurality of moistened cleansing towels therein, and
wherein said first clip means comprises a resilient elongate clip of a length less than a length defined by said container wherein said first clip is integrally secured to a side wall of said container and spaced from an opposing side wall of said container, and
wherein said second clip means comprises a plurality of rigid clip members, each clip member is secured to an opposing side wall of said lid and spaced from an interior surface formed by the top of said lid.

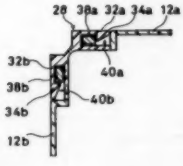
4,892,189

CASE FOR MULTIPLE COMPACT DISKS

Noriaki Kunimune, Higashiosaka, and Yukio Wada, Kyoto, both of Japan, assignors to Kunimune Kogyosho Co., Ltd., Osaka, Japan

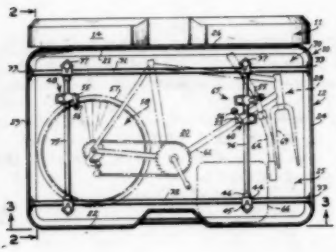
Continuation of Ser. No. 147,203, Jan. 22, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,517
Claims priority, application Japan, Sep. 24, 1987, 62-145670[U]; Nov. 6, 1987, 62-170576[U]
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—232 5 Claims





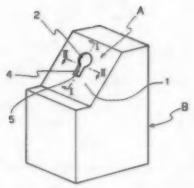
1. A compact disk carrying case comprising:
two separate and distinct case members for forming a plurality of storage compartments in cooperation with each other in a closed state, each of said case members including a plurality of concave portions for the purpose of storing said compact disks, each concave portion in one case member being complimentary to a corresponding concave portion in the other of said case members each of said case members being provided along corresponding edges with engaging means,
detachable connecting members provided on said corresponding edges of said two case members for connecting with said engaging means for hinging said two case members in a manner capable of opening and closing said case, and
latching means provided at corresponding edges of each case member opposite said hinged edges of said two case members for holding said two case members in a closed state, thereby forming said plurality of storage compartments for containing a multiplicity of compact disks.

4,892,190
BICYCLE CASE
Charles B. Delgado, 416 21st Ave., South, Nashville, Tenn. 37203
Filed Jun. 19, 1989, Ser. No. 367,800
Int. Cl.[4] B65D *85/68*
U.S. Cl. 206—335 9 Claims



1. A case for receiving a disassembled bicycle, comprising:
(a) an elongated bottom container section having a bottom wall, opposed elongated side walls, and opposed end walls defining a bottom chamber large enough to receive a bicycle frame and an assembled rear wheel, and having an upper opening,
(b) an elongated top container section having a top wall, opposed elongated side walls, and opposed end walls defining an upper chamber of substantially the same length and width as said bottom chamber and having a depth great enough to receive flat against said top wall the disassembled front wheel of the bicycle frame received in said bottom chamber, and having a lower opening,
(c) said top and bottom container sections having a closed position in which said corresponding side and end walls engage each other and said upper and lower openings oppose each other to enclose the contents of said container sections, and an open position in which said container sections are separated,
(d) a bicycle support system comprising first and second longitudinal support bars in said bottom chamber having opposite ends secured to said opposed end walls of said bottom section, said longitudinal support bars being spaced from said bottom wall and parallel to each other,
(e) said bicycle support system further comprising a pair of transverse support bars having lengths less than the width of said bottom section and having first and second end portions,
(f) first clamp means connected to said first end portions and second clamp means connected to said second end portions, said first clamp means slidably engaging said first longitudinal support bar and said second clamp means slidably engaging said second longitudinal support bar,
(g) means for actuating said clamp means to selectively secure said clamp means on said corresponding longitudinal support bar, and
(h) at least one tie device, each said tie device comprising a clamp member adapted to adjustably secure said tie device upon a transverse support bar, and a tie member adapted to be secured around a component of a bicycle frame assembly received on said support system.

4,892,191
CONTAINER HAVING INJECTION NEEDLE-DETACHING MEANS
Motohiko Nakamura, Kamakura, Japan, assignor to Nissho Corporation, Osaka, Japan
Continuation of Ser. No. 225,985, Jul. 29, 1988, abandoned. This application Jun. 20, 1989, Ser. No. 368,888
Claims priority, application Japan, Jul. 31, 1987, 117564
Int. Cl.[4] B65D *25/00*; B65F *1/02, 7/00*
U.S. Cl. 206—366 4 Claims

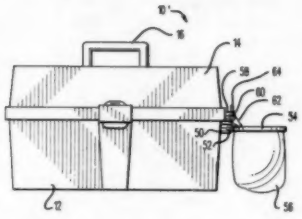


1. A container having an injection needle detaching means for containing used injection needles comprising:
a closed container for containing injection needles, and
a needle-detaching means for detaching a slip type injection needle from a syringe,
said needle-detaching means comprising a first opening provided in a wall of said container for inserting said needle attached to said syringe, a second opening extending laterally from said first opening, and a sliding portion provided on each of both sides of said second opening,
said first opening having a size larger than the largest part of said needle,
said second opening having a width larger than the diameter of the nozzle of said syringe and smaller than the diameter of the hub of said needle,
each of said sliding portion having a side wall defining said second opening,
each of said side walls having, at the entrance of the second opening from said first opening, a thickness smaller than a distance between the root of the nozzle of said syringe and the bottom end of the hub of said needle when the needle is being attached to said syringe, each of said side walls being made gradually thicker toward the closed end of said second opening, the maximum thickness of each side wall being larger than said distance, the surface of said sliding portion on the rear side of said wall of said container, on which the bottom surface of the hub slides, forms a surface inclined both in the direction of the first opening and in the direction of the second opening.

4,892,192
COUPON ORGANIZER
Timothy J. Hague, Sr., and Linda E. Hauge, both of 18 Rose Ave., Gibbstown, N.J. 08027
Filed Feb. 6, 1989, Ser. No. 306,635
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—425 3 Claims

1. A coupon organizer for organizing and transporting coupons and shopping accessory items, comprising:
a box-shaped rectangular housing having a hinged cover;
fastening means for securing said cover in a closed position;
a carrying handle mounted on an upper exterior surface of said cover;
a plurality of spaced hook and loop fastening members secured on an interior surface of said cover for removably securing various accessory items;
said housing divided into left and right compartments, with each of said left and right compartments housing a plural-

ity of reduced sized hanging file folder for alphabetically organizing coupons; and



a retractable waste receptacle pivotally mounted on an exterior side wall of said housing.

4,892,193

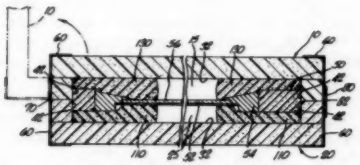
EXPANDED PLASTIC PACKAGING SYSTEM FOR SUBSTANTIALLY PLANAR OBJECTS

Gregg Thomas, 7927 Hesperia Ave., Reseda, Calif. 91335

Continuation of Ser. No. 85,527, Aug. 14, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,191

Int. Cl.[4] B65D *85/48*

U.S. Cl. 206—453 **34 Claims**



1. In combination, a substantially rigid bottom of expanded plastic and a complementary substantially planar and rigid lid of expanded plastic, the bottom and the lid each having exterior edges and corners and the bottom internally defining an open-faced cavity having sides and a polygonal inside surface, the open-faced cavity being adapted to receive through the open face and contain a substantially planar object, the lid being so dimensioned that it may be placed over the open face of the cavity in the bottom to cover the same and at least one strip of adhesive plastic tape may be placed over and along an outside juncture of the bottom and the lid in order to detachably secure the lid to the bottom and seal the cavity, the bottom and the lid each having a protective plastic coating on the edges and corners to resist chipping and cracking and an impact absorption means adapted to be placed within the cavity and between the object and at least one side of the cavity in order to absorb impact forces transmitted from the side of the cavity to the object.

4,892,194

DISPLAY PACKAGE FOR A COSMETIC ARTICLE

Frank Garcia, Brooklyn, N.Y., assignor to Arthur Matney Company, Inc., Brooklyn, N.Y.

Filed Feb. 13, 1989, Ser. No. 310,365

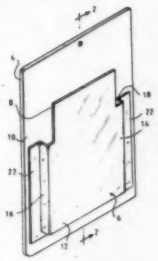
Int. Cl.[4] B65D *73/00*

U.S. Cl. 206—470 **19 Claims**

1. A display package for a cosmetic article, which comprises:

a support backing having a display surface;

a pre-formed blister mounted on the display surface of the support backing, the pre-formed blister having a main blister portion including a top wall which is raised from the display surface, an edge flange joined to the main blister portion and secured to the display surface, and side walls connecting said top wall with said edge flange, the main blister portion having an open side and defining a pocket for receiving a cosmetic article therein and for securing the article to the support backing; and



a flexible tongue joined to and extending from said top wall of said main blister portion and extending over said open side of said main blister portion, said flexible tongue being of sufficient length to be contacted with said display surface.

4,892,195

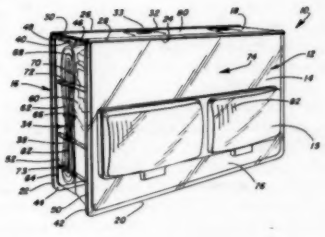
RECLOSABLE BOOK-LIKE PACKAGE

Daniel J. Slavin, Crystal Lake, and John R. Kreider, Carol Stream, both of Ill., assignors to Dordan Manufacturing Co., Chicago, Ill.

Filed Jun. 3, 1988, Ser. No. 202,700

Int. Cl.[4] B65D *1/24*

U.S. Cl. 206—473 **42 Claims**



1. A package adapted to be opened and closed like a book, comprising:

a transparent inner portion including a first leaf, a second leaf and a spine, said leaves each having an inner edge margin hinged to a corresponding edge of said spine, said inner portion having at least one formation for retaining articles therein;

a transparent outer portion, including a first leaf, a second leaf and a spine, said leaves each having an inner edge margin hinged to a corresponding edge of said spine; and

means for sealing said inner portion to said outer portion so that said first leaves, said second leaves and said spines of said inner and outer portions are in register with each other and the articles may be enclosed within said at least one formation and between said inner and outer portions, and may be visually inspected by opening and closing said leaves of said package without breaking the seal.

4,892,196

PARTITION WALL FOR PACKING COMPRESSORS

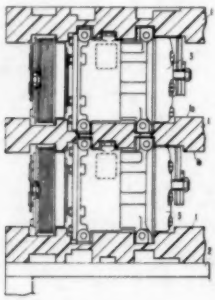
Yoshiaki Okajima, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Apr. 27, 1988, Ser. No. 186,960

Claims priority, application Japan, Apr. 27, 1987, 62-62735[U]

Int. Cl.[4] B65D *81/06*

U.S. Cl. 206—523 20 Claims



1. A package for a plurality of compressors comprising:

a plurality of partition walls for securely laying compressors thereon, each partition wall consisting of foamed plastic material, both the upper and lower surfaces of each partition wall being formed with cavities which are formed in substantially imperforate portions of said upper and lower surfaces of said partition walls and which are adapted to conform closely to the shape of the compressors so that each said partition wall is disposable on top of a first layer of compressors and a second layer of compressors is disposable on top of each partition wall, thereby permitting the compressors to fit closely within the compressor-shaped cavities in said upper and lower surfaces of said partition walls;

means for supporting said partition walls and plurality of compressors comprising a pallet; and

means for wrapping the partition walls and the pallet comprising stretch film.

7. A partition wall for use in packaging a plurality of compressors, said partition wall consisting of foamed plastic material, wherein both the upper and lower surfaces of said partition wall are provided with cavities formed in substantially imperforate portions of said upper and lower surfaces of said partition wall, each cavity closely conforming to a portion of the contour of a compressor, so that said partition wall is disposable on top of a first layer of compressors and a second layer of compressors is disposable on top of said partition wall thereby permitting the compressors to fit closely within the compressor-shaped cavities in said upper and lower surfaces of said partition wall.

19. A method of packaging a plurality of compressors comprising the steps of:

supporting a first partition wall consisting of foamed plastic material and having substantially imperforate portions in both the upper and lower surfaces thereof formed with depressions closely conforming to the shape of the compressors;

laying compressors in the depressions formed in the upper surface to form a first layer of compressors; and

placing a second partition wall similar to said first partition wall on top of said first layer of compressors so that the compressors securely fit in the depressions formed in the lower surface thereof.

4,892,197

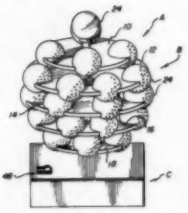
GOLF BALL DISPLAY STAND

Carroll A. Slattery, 882 Harness Trail, and Carlos Z. Rodriguez, 10144 Colebrook Ave., both of Potomac, Md. 20854

Filed Mar. 16, 1989, Ser. No. 324,089

Int. Cl.[4] A47G *19/28*

U.S. Cl. 211—14 15 Claims



1. A display device for displaying golf balls or the like, comprising:

(a) an upper section including a plurality of supporting means arranged in a stacked fashion;

(b) a base section supporting said upper section and including an upper surface;

(c) a plurality of spacer means interposed between said supporting means and including top and bottom spacer means, said top spacer means including means for displaying a golf ball and said bottom spacer means being disposed above said upper surface of said base section;

(d) each said supporting means being generally flat and circular and including a peripheral edge;

(e) a series of similar C-shaped cut-out recesses cut into said peripheral edge so that the open portion of said C-shape faces outwardly of said peripheral edge and for receiving and supporting a spherical article of a diameter greater than the diameter of said C-shaped cut-out recesses such that said spherical article when supported in said C-shaped recess has a substantial portion extending beyond said peripheral edge;

(f) said spacer means being of a length slightly less than the diameter of the spherical articles to be supported on the display device;

(g) said C-shaped cut-out recesses being of similar dimension and spaced equidistant around said peripheral edge;

(h) said C-shaped cut-out recesses being generally circular in configuration; and

(i) said upper section being generally spherical in shape so that when displayed with the spherical articles the display device with the spherical articles thereon will have the appearance of a spheroid with dimples thereon.

4,892,198

ARTICLE DISPLAY APPARATUS

Barry T. Johnson, Meadow Cottage, Normanton on Soar, Loughborough, Leicestershire, England

Filed Oct. 20, 1988, Ser. No. 260,924

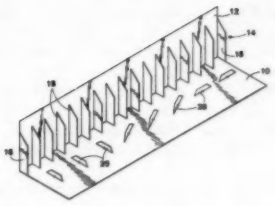
Claims priority, application United Kingdom, Oct. 21, 1987, 8724686

Int. Cl.[4] A47G *19/08*

U.S. Cl. 211—41 4 Claims

1. Apparatus for retaining articles for display, the apparatus comprising a base, an upstanding wall on one side of the base provided with a plurality of parallel, inwardly extending fixed ribs so spaced as to allow edgewise location of an article between adjacent ones of the ribs, and a plurality of abutment members which are spaced from the ribs towards the other side of the base, the abutment members being mounted on the base for movement between one position, wherein the abutment members are aligned with respective alternate ones of the ribs

to enable an edgewise display of the articles, and a position at right angles to the ribs to enable a full faced display of the



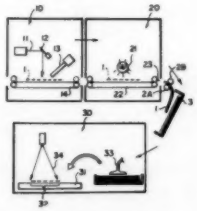
articles, through an intermediate position enabling an angled face display of the articles.

4,892,199

STIMULABLE PHOSPHOR SHEET STACKING TRAY

Isao Utsumi; Yasuhiro Kawai; Kaoru Tamura, all of Kanagawa; Yasunori Maehara, Tochigi; Sigeme Fujiwara, Tochigi, and Katsuhide Koyama, Tochigi, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 808,174, Dec. 12, 1985, abandoned.
This application Jun. 15, 1988, Ser. No. 206,980
Claims priority, application Japan, Dec. 13, 1984, 59-263500; Dec. 13, 1984, 59-263501; Dec. 13, 1984, 59-263502
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—51 9 Claims



1. A stacking tray for stacking stimulable phosphor sheets fed thereto by a feed mechanism, comprising:

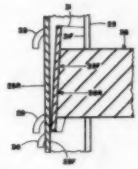
a tray member having a guide means for laterally aligning stimulable phosphor sheets in a direction generally perpendicular to the direction of travel of the sheets during entry thereof into said tray member, said guide means including a tapered section for laterally aligning said stimulable phosphor sheets and an upright section extending parallel to an inner side wall of said tray member for positioning said phosphor sheets in a predetermined position, said guide means being disposed at said inner side wall of said tray member to guide a lower end portion of said stimulable phosphor sheet during entry thereof into said tray member to an end wall of said tray member for aligning and maintaining the positioning of said phosphor sheets in said predetermined position as said phosphor sheets fall under their own weight.

4,892,200

RETAILING DISPLAY ASSEMBLY

Joel H. Alperson, 3306 S. 157th St., Omaha, Nebr. 68130

Filed May 30, 1989, Ser. No. 358,148
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—193 3 Claims



1. Retailing display assembly comprising:

(A) an upright channel member that is symmetrical with respect to a directionally laterally extending imaginary vertical-plane and that comprises five upright walls including:

(Ai) a directionally laterally extending left-wall located leftwardly of said vertical-plane,

(Aii) a directionally laterally extending right-wall located rightwardly of said vertical-plane,

(Aiii) a directionally transversely extending left-front-wall connected to a forward portion of said left-wall and located wholly leftwardly of said vertical-plane,

(Aiv) a directionally transversely extending right-front-wall connected to a forward portion of said right-wall and located wholly rightwardly of said vertical-plane, and

(Av) a directionally transversely extending rear-wall perpendicularly intersecting said vertical-plane and being connected to rearward portions of said left-wall and said right-wall, said rear-wall at two columnar positions therealong being rearwardly struck to provide two columns of spaced openings and wherein each opening is canopied by the rear-wall structural material; and

(B) a vertically slidable bracket in self-locking combination with said channel member interior, said bracket comprising:

(Bi) an upright web member having transversely extending front-surface and rear-surface, said rear-surface confronting the column rear-wall,

(Bii) attached to transversely separated locations of said web member and flanking said vertical-plane, a pair of upright wings extending directionally laterally forwardly of said web member, each said wing being laterally thickest at the wing upper portion and thereat including an abutment-face confronting a column front-wall,

(Biii) attached to transversely separated locations of said web member, a pair of downwardly and rearwardly extending tabs respectively extending into transversely separated and co-elevational column openings, and

(Biv) an elongate hanger bar attached to a central portion of said web member and extending substantially horizontally forwardly therefrom.

4,892,201

JIB SYSTEM FOR CRANES, ESPECIALLY MOBILE CRANES

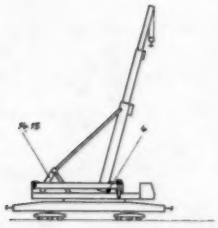
Harry Hellwig, and Klaus-Dietrich Sturm, both of Leipzig, German Democratic Rep., assignors to VEB Schwermaschinenbaukombinat Takraf, Leipzig, German Democratic Rep.

Filed May 11, 1988, Ser. No. 192,812

Claims priority, application German Democratic Rep., Jul. 8, 1987, 304749

Int. Cl.[4] B66C 23/26

U.S. Cl. 212—186 6 Claims



1. In a jib system for a crane mounted to swivel about a pivot on an upper section of the crane, the jib system including a telescopic jib mounted to be shifted by a jib forwarding mechanism, the improvement wherein the pivot of the telescopic jib is movably mounted in a jib trough, the jib trough is mounted to be luffed by a working cylinder, and further comprising retracting means for retracting said telescopic jib, said retracting means comprising a cable pulley, retracting support means for holding said cable pulley on said crane, a pulling element connecting said cable pulley to said telescopic jib, and lifting means for raising and lowering said support means, whereby said jib is pivoted about said pivot.

4,892,202

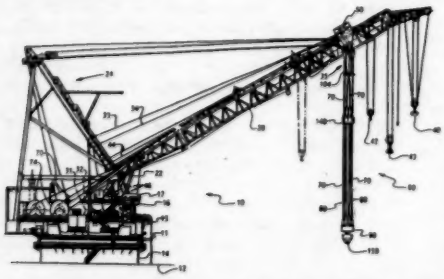
DEEPWATER EXTENDED HOOK TRAVEL ATTACHMENT

John E. Hey, Eagan; Pierre C. Delago, Afton, and James A. Carlson, St. Paul, all of Minn., assignors to Amca International Corporation, St. Paul, Minn.

Filed Apr. 28, 1988, Ser. No. 187,615

Int. Cl.[4] B66C 23/52

U.S. Cl. 212—192 20 Claims



1. An apparatus to increase available hook raising and lowering distance for attachment to a crane or other lifting structure having a boom and at least one lifting hook tackle utilizing at least one lifting line connected to a prime mover comprising:

support means attached to the boom substantially at the connection point of said at least one tackle for supporting a pendant platform;

a lower gripper platform suspended from said support means by pendant lines and being movable with said boom, said lower platform having at least one cable gripper mounted thereon;

an upper gripper platform operatively connected to the at least one lifting line associated with said at least one tackle above said lower gripper platform, said upper platform having at least one cable gripper mounted thereon and adapted to reciprocate between said lower gripper platform and said support means in response to the prime mover drawing in or paying out said at least one lifting line via said at least one tackle;

at least one extended load line passing through the at least one cable gripper on each of said lower and upper gripper platforms;

means for taking up and letting out the at least one extended load line; and

control means connected to said at least one cable gripper mounted on each of said lower and upper gripper platforms for causing said cable grippers individually and selectively to release or to grip said at least one extended load line.

4,892,203

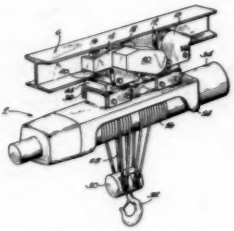
HOIST SWIVEL SUPPORT HAVING SWIVELABLE SURFACE AND BEARING INSERTS

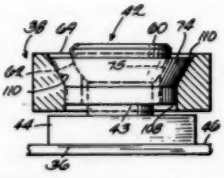
Ronnie A. Arav, Netania, Israel, assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Oct. 5, 1988, Ser. No. 253,522

Int. Cl.[4] B66C 17/06

U.S. Cl. 212—221 6 Claims





1. In a hoist suspended from and travelable along a track means for raising, transporting and lowering material, the hoist including a frame, a rotatable drum mounted on the frame, a cable connected to and windable on to and off of the drum, a load hook attached to the cable for holding the material as the cable is wound on to or off of the drum when the drum rotates in one of said directions whereby the material is raised or lowered, the combination comprising:

trolley means supported on and movable along the track means for carrying the hoist in a suspended manner and including a swivel yoke having an opening therethrough, the opening having a support surface;

a swivel body affixed to the hoist frame and having an upper member projecting through the opening in the swivel

yoke, the upper member including a swivel head having a swivelable surface;

a plurality of swivel bearing inserts each movable from a position exteriorly of said opening to a position within said opening between the swivelable surface of the swivel head and the support surface of the swivel yoke; and

the swivelable surface of the swivel body is in supporting engagement with the swivel bearing inserts whereby the hoist frame is supported by the trolley means and the hoist frame and drum are free to rotate relative to the trolley means.

4,892,204

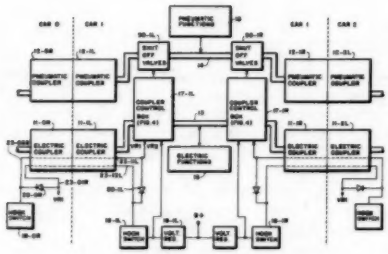
AUTOMATIC COUPLER CONTROL SYSTEM

Anthony Lumbis, Watertown, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 2, 1988, Ser. No. 202,085

Int. Cl.[4] B61G *5/06*

U.S. Cl. 213—1.6 **4 Claims**



1. In an electric coupling system for at least two railway vehicles in which each vehicle has a first electric line adapted for coupling to a battery and a second electric line adapted for connection to electric circuits, and an electric coupling element that interconnects the lines of the two vehicles when they are coupled; the improvement comprising:

electric isolation means for each vehicle for isolating the battery of each vehicle from its corresponding second line and electric circuits when the two vehicles are uncoupled while providing electric continuity therebetween when the two vehicles are coupled, such isolation means comprising a diode connected between the corresponding first and second lines with a polarity to isolate the battery from its corresponding second line; and

the electric coupling elements of the two vehicles mating in the coupled condition to provide a connection of the first and second lines of a first of the vehicles with the second and first lines, respectively, of the second of the vehicles, whereby upon coupling the battery of the first vehicle is coupled in a first circuit with its corresponding second line via the two electric coupling elements and the second line and diode of the second vehicle.

4,892,205

CONCENTRIC RIBBED PREFORM AND BOTTLE MADE FROM SAME

Thomas F. Powers, Ypsilanti, and William G. Kinslow, Saline, both of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Jul. 15, 1988, Ser. No. 219,731

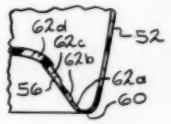
Int. Cl.[4] B65D *1/02, 23/00*

U.S. Cl. 215—1 C **13 Claims**

3. A plastic container comprising an upright hollow body having an upright longitudinal axis, said body having a tubular side wall merging at its lower end with a base structure, said base structure comprising:

a bottom wall having an upwardly facing inner surface;

a plurality of substantially continuous annular reinforcing ribs on said inner surface, said ribs being generally concentric about said axis and being of increased thickness relative to said tubular side wall, the wall thickness of each rib



being greater than the wall thickness of the preceding rib as the ribs progress toward the axis and said ribs being adjacent one another in a radial direction resulting in an increasing wall thickness of said bottom wall in a direction radially inwardly toward said axis.

4,892,206

REFILL BOTTLE

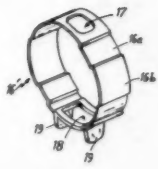
Alain Perrin, Rueil Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Jan. 13, 1988, Ser. No. 143,484

Claims priority, application France, Jan. 16, 1987, 87 00468

Int. Cl.[4] B65D *8/04, 8/08/23/08;* **A45D** *34/00*

U.S. Cl. 215—12.1 **4 Claims**



1. Container for a refill bottle comprising two half-shells connectable along a substantially medial plane, the first one of said half-shells comprising a stand at its lower portion, the second one of said half-shells including releasable means for joining said second one of said half-shells with the lower portion of said first one of said half-shells, while allowing said second half-shell to be released to permit insertion of a refill bottle within said container and to close said second one of said half-shells against said first one of said half-shells, said shells including a neck receiving portion and having adjacent said neck receiving portions a releasable locking means for securely joining said two half-shells together, said container including compensation means comprising a slightly deformable bracelet of plastic material which is located at the periphery of the refill bottle between said half-shells and said refill bottle for compensating the clearance of variable extent that may exist between the half-shells and the refill bottle.

4,892,207

BOTTLED WATER CONTAINER

Michael D. Cullis, Middletown, N.J., assignor to The Perrier Group of America, Inc., Greenwich, Conn.

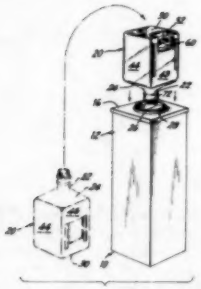
Filed Mar. 28, 1988, Ser. No. 173,925

Int. Cl.[4] B65D *21/02, 23/10, 23/14*

U.S. Cl. 215—100 A **24 Claims**

1. A container for liquids comprising a body portion and a feed neck opening at one end whereby liquid enters or exits from the container substantially in the direction of its longitudinal axis, a recess formed adjacent an end portion of the

container body opposite said feed neck opening and having its major axis oriented generally transverse to but not intersecting the longitudinal axis of the container, and a handle straddling



said recess in a direction substantially parallel to the major axis of said recess whereby said handle may be gripped by a hand entering said recess to extend around the handle for up-ending the container from an upright orientation to a feed orientation.

4,892,208

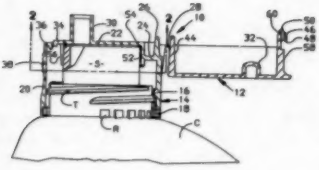
CHILD-RESISTANT CLOSURE ASSEMBLY

Larry C. Sledge, Midlothian, Va., assignor to Specialty Packaging Licensing Company, Wilmington, Del.

Filed Sep. 19, 1988, Ser. No. 245,639

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—216 **5 Claims**



1. In combination, a container having a generally cylindrical upward dispensing spout and a concentric cylindrical enlargement at the base of the spout, the enlargement having threads about its side wall, and a cap having a top wall and a cylindrical side wall depending thereabout and having threads about the inside of the lower end thereof, the threads adapted to mate with the threads on the enlargement, the cap also having downward from the top wall an alignment sleeve concentric with the side wall and spaced thereinside, annular sealing means on the underside of the top wall inside the sleeve, the top wall of the cap being formed with a discharge orifice, the cap being provided with a hinged lid having a depending latch hook opposite the hinge, the top wall having a latch opening opposite the hinge adapted to lachingly receive the latch hook, a latch operator tab being formed on the side wall of the cap aligned with the latch when the lid is in the closed position, the sleeve being interrupted proximate the latch opening to avoid interference with the unlatching movement of the latch toward the hinge and the spout of the container forming a backstop for the latch hook, the sleeve adapted to fit closely over the outside of the spout on the container prior to the engagement of the mating threads, and thereby to prevent the cocking of the cap on the container and the assure proper square engagement of the spout with the sealing means.

4,892,209

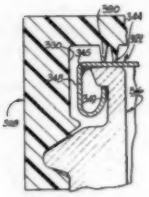
LIQUOR BOTTLE CAPPING ASSEMBLY

Jan L. Dorfman, Littleton; Harold Cook, Jr., Evergreen, and Bruce A. Moen, Golden, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Continuation of Ser. No. 203,684, Jun. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 86,567, Aug. 18, 1987, Pat. No. 4,767,016. This application May 19, 1989, Ser. No. 355,790

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—277 **7 Claims**



1. A liquor bottle capping assembly for a liquor bottle having a threaded opening comprising:

perforated member means fixedly attachable to the liquor bottle in covering relationship with said threaded opening in the liquor bottle for preventing flame propagation into the liquor bottle;

gasket means positionable between said threaded opening and said perforated member means for providing a peripheral seal therebetween;

capping means threadably attachable and detachable on said threaded opening for providing a removable and reattachable closure for said liquor bottle opening;

wherein said perforated member means comprises a relatively thin member having a plurality of holes in a central portion thereof;

wherein said holes in said perforated member means each having a hole area of between 0.0028 square inches and 0.0044 square inches.

4,892,210

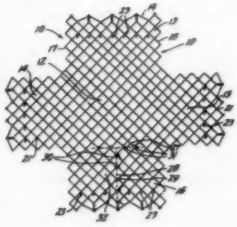
CONTAINER CARGO NET

Julius B. Kupersmit, 299 West 12th St., New York, N.Y. 10014

Filed Oct. 17, 1988, Ser. No. 258,625

Int. Cl.[4] B65D *88/16*

U.S. Cl. 220—1.5 **4 Claims**



1. In an improved cargo net for use in enclosing an individual, generally rectangular cargo container to permit anchoring of the container with respect to a vehicle hold in which the container is positioned, said net being of generally cruciform shape, including a centrally disposed portion, and four leg portions, said leg portions having end edges and means for engaging corresponding lower edges of a container, the im-

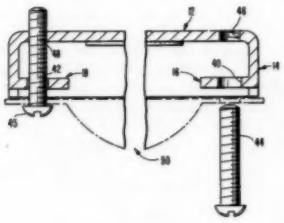
provement comprising: one of said leg portions having a T-shaped opening therein with abutting vertical edges extending to a corresponding end edge; and plural hook means for selectively closing said T-shaped opening, whereby to permit selective access to said container without the necessity of folding said leg portion over the roof of said container.

4,892,211

CEILING BOXES FOR CEILING FAN SUPPORT

Robert W. Jorgensen, Niles, Mich., assignor to Hubbell Incorporated, Orange, Conn.

Filed Apr. 18, 1988, Ser. No. 182,413
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.2 **15 Claims**



1. A ceiling box **10** adapted to mount and support a ceiling fan thereto via a pair of mounting screws and comprising:

a top portion **12**;

a side portion **14**, said side portion extending substantially normal and rigidly coupled to said top portion to form a box open at one end; and

a pair of flanges **16,18** projecting substantially normal and rigidly coupled to said side portion, each of said flanges including a hole **40,42** extending normal therethrough;

said top portion having a pair of threaded mounting holes extending normal therethrough, each of said mounting holes **46,48** being axially aligned with one of said flange holes, wherein each of said mounting holes and the respective aligned flange hole are adapted to receive a mounting screw for mounting and supporting the ceiling fan thereto, said mounting holes adapted to threadedly receive the mounting screws therein.

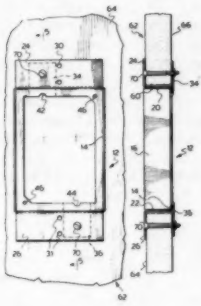
4,892,212

WALL BRACKET FOR MOUNTING AN ELECTRICAL CONNECTOR

Norman J. Andreyko, 34 Norgrove Crescent, Etobicoke, Ontario, Canada M9P 3C6

Filed Oct. 25, 1988, Ser. No. 261,864
Int. Cl.[4] H02B *1/02*
U.S. Cl. 220—3.3 **6 Claims**

1. A wall bracket for mounting an electrical connector for data or communications in an aperture in a wall panel, said bracket comprising a box-like body of sheet metal having a base with opposed end walls extending forwardly therefrom, each end wall having a front mounting flange extending substantially perpendicularly from a front end thereof in an outward direction, and the base having an opening and a pair of mounting tabs extending in opposite directions in the opening from opposite ends of the opening, each mounting tab having a length sufficient to enable the tab to be bent rearwardly through substantially 180°, after the bracket has been positioned in a wall panel aperture to position the front mounting flanges against a front face of the panel, to cause the tabs to engage a rear face of the panel as rear mounting flanges and enable securing devices to be passed through the front mounting flanges, the wall panel and the rear mounting flanges, and an auxiliary plate separate from the box-like body and insertable into the body from the front thereof, after the tabs have



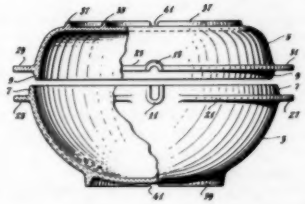
been rearwardly bent, to engage the base for securement thereto.

4,892,213

MICROWAVE COOKING AND SERVING DISH

Stanley I. Mason, Jr., 61 River Rd., Weston, Conn. 06883

Filed Jan. 6, 1986, Ser. No. 816,351
Int. Cl.[4] B65D *6/02, 21/02, 43/08*; H05B *6/80*
U.S. Cl. 220—4 B **2 Claims**



1. A reversible, two-section microwave cooking vessel capable of being used with either section on the base and the other section as the top, with the two sections interfitting, said vessel including

a first bowl and a second bowl made of material which is transparent to microwaves, said first bowl having a larger volumetric capacity than said second bowl, said bowls being of generally similar shape,

each of said bowls having a vertical upstanding rim along the inner edge of the periphery thereof, said rims being complementary and interfitting, with said rim of said first bowl fitting outside the said rim of said second bowl,

horizontal peripheral lips on each said bowl, said lips being proximate to, but spaced from, said rims on their respective said bowls, and the outer of said rims of one said bowl resting on the lip of the other said bowl when said bowls are assembled and thereby spacing said lips from one another,

said lips defining pairs of handle extensions at opposite ends of said bowls and being so spaced from one another when said bowls are interfitted as to permit grasping said pairs between thumb and forefinger of one's hands and far enough apart to permit a finger to come between them to separate said bowls, and

a probe hole in said rims, said probe hole being aligned in said rims of said bowls and being midway between said pairs of handle extensions at said opposite ends of said bowls,

whereby said lips together define spaced handle extensions when said bowls are assembled.

4,892,214

METAL CONTAINER AND METHOD OF MANUFACTURING THE SAME

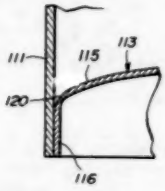
Masami Hamaguchi, Takatsuki; Hiromu Yanagihara, Osaka; Osamu Hiraoka, Takatsuki, and Osamu Takahashi, Nagaokakyo, all of Japan, assignors to Shiseido Company Limited, Tokyo and Asia Can Company Limited, Osaka, both of, Japan

Filed Sep. 8, 1987, Ser. No. 93,718

Claims priority, application Japan, Aug. 9, 1986, 61-212502; Mar. 23, 1987, 62-68467; Mar. 23, 1987, 62-68466; Apr. 3, 1987, 62-31242[U]; May 11, 1987, 62-114286

Int. Cl.[4] B65D 7/42

U.S. Cl. 220—67 **17 Claims**



1. A metal container comprising:

a metal body means having an integral top cover and formed by drawing and ironing;

a metal bottom plate means having a central curved surface portion projecting toward the interior of the container, a peripheral cylindrical portion extending parallel to said body means, and a bending portion formed at the boundary between the curved surface portion and the cylindrical portion and having a reduced thickness to that of the curved surface portion and cylindrical portion;

an adhesive means for attaching said cylindrical portion of the bottom plate means to said body means;

a tight curl means formed by curling tight a lower portion of the body means inwardly to fasten it to the cylindrical portion of said bottom plate means; and

a take out means applied to the top cover for taking out the content from the container,

said bottom plate means being fitted in the bottom of said body means and attached together by said adhesive means, said tight curl means fastening said bottom plate means to said body means so as not to expose said tight curl means outside of the container, and said bending portion expanding in diameter when the internal pressure is applied on the central curved surface portion of the bottom plate means so as to increase contact pressure between said cylindrical portion of the bottom plate means and said body means.

4,892,215

BOTTOM CLOSURE FOR A BEVERAGE CONTAINER SLEEVE

Robert W. Carlson, Belton, and Douglas J. Ham, Austin, both of Tex., assignors to Custom Printing, Inc., Austin, Tex.

Filed Feb. 17, 1989, Ser. No. 311,870

Int. Cl.[4] B65D 25/24

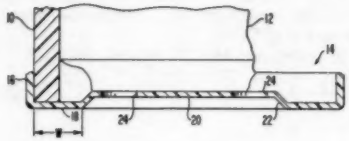
U.S. Cl. 220—69 **2 Claims**

1. A bottom closure for a beverage container sleeve, the sleeve being of the type comprising a tubular length of thermally insulating material dimensioned to receive a beverage container therein, the closure comprising

a unitarily formed body of soft, flexible polyvinyl chloride having

a short cylindrical having an inner surface dimensioned to receive therein an end portion of a beverage container sleeve;

an annular, generally planar bottom ring having a radial width significantly greater than the radial thickness of said beverage container sleeve, the outer periphery of said bottom ring being substantially continuously connected to an end of said cylindrical side wall;



a central bottom disk for receiving and supporting a beverage container inserted into said sleeve, said disk having a downwardly and outwardly sloping wall joining the outer periphery of said central disk to the inner periphery of said ring; and

means defining a plurality of openings through said central disk.

4,892,216

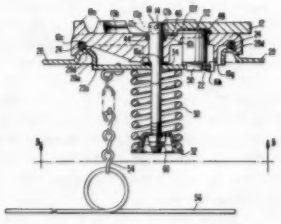
FUEL FILLER CAP WITH OVERPRESSURE RELIEF

Richard E. Scott, Naples, Fla., assignor to Shaw Aero Development Inc., Naples, Fla.

Filed Jan. 13, 1989, Ser. No. 296,570

Int. Cl.[4] B65D 51/16

U.S. Cl. 220—206 **21 Claims**



1. A filler cap for mating with an adapter comprised by a fuel tank, said adapter comprising a circular wall defining a circular filler opening into said tank, an annular sealing member of generally uniform cross-sectional shape upstanding from an exterior wall of said tank, and a plurality of ears spaced circumferentially around and extending radially inwardly from the circular wall, said cap comprising:

a cap body member having formed therein an annular surface for receiving said annular sealing member;

first seal means disposed on said sealing member or within said groove for engaging the other of said sealing member and groove to form a gas-tight seal therewith;

an anchor disk comprising a central portion and a plurality of fingers equal in number to said plurality of ears spaced circumferentially around said central portion;

an actuator rod extending through a central hole formed in said cap body member and a central hole in said central portion of said anchor disk, so that said anchor disk is enabled to slide along said actuator rod;

an actuator lever pivoted to a first end of said actuator rod at an axis external to said cap body member, said actuator lever comprising a cam surface contacting a mating surface on an outer surface of said cap body member, the

pivot point being located with respect to said lever surface such that pivoting of said actuator lever from a first free to a second locked position moves said actuator rod axially outwardly with respect to said cap body member; and

a first pressure limiting spring disposed between a second end of said actuator rod and said anchor disk, urging said anchor disk into engagement with a shoulder formed on said actuator rod;

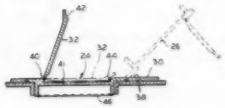
whereby if gas pressure on the inner surface of said cap body member exceeds the force exerted on said anchor disc by said first spring when said actuator lever is in its locked position, said cap body member is moved axially outwardly, off said annular sealing member, releasing said pressure.

4,892,217

TAMPER EVIDENT DISPENSING CLOSURE

Eugene D. Shastal, 1149 S.E. Coral Reef St., Port St. Lucie, Fla. 34983

Filed Jul. 11, 1988, Ser. No. 217,477
Int. Cl.[4] B65D *51/22*
U.S. Cl. 220—258 **12 Claims**



1. A tamper-evident closure for selectively closing an opening of a container, said closure comprising:

a base element having a central opening larger than the container opening and means for affixation of the base element to the container so that the container opening is disposed entirely within said central opening;

a control element integral with said base element and disposed inwardly of said base element central opening and having a stopper portion including a sleeve having an outer diameter substantially identical to an inner diameter of the container opening and adapted to be received in the container opening, and manipulating means for withdrawing the stopper portion from the container opening; and

a puncturable film secured to said closure base element and extending across the base element central opening and held between said sleeve and the container opening for obstructing the container opening when said base element is affixed to the container.

4,892,218

LID CONTROL DEVICE FOR REFUSE CONTAINERS

Raymond J. Relling, 620 Elm St., Coon Rapids, Iowa 50058

Filed Oct. 3, 1988, Ser. No. 252,543
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—263 **8 Claims**

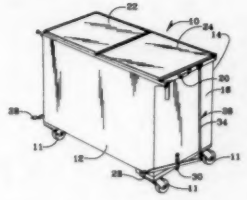
1. In combination with a rectangular refuse container having a generally rectangular body with a bottom, front and rear walls, opposite end walls, an open top, defined by a rim portion comprising the upper ends of said front, rear and end walls, at least one closable lid extending across said open top and hinged adjacent the upper end of said rear wall, and lifting brackets secured to said upper ends of said end walls between the front and rear walls and located substantially on said rim portion to facilitate grasping of said container by the lifting mechanism of a refuse truck located forwardly of said container, the improvement comprising,

a linkage means secured to said container to permit the selective pivotal raising of said lid for purposes of depositing refuse in said container,

said linkage means comprising a generally horizontal foot pedal arm pivotally secured adjacent its center portion to the bottom portion of one of said end walls,

said foot pedal arm having a forward end terminating in a foot pedal means,

a vertically disposed lifting arm having upper and lower ends and pivotally secured by its lower end to the other end of said foot pedal arm,



a keeper bracket means secured to said rim portion rearwardly of one of said lifting brackets and slidably receiving the upper end of said lifting arm, the position of said keeper bracket freeing said lifting arm from engagement with said lifting mechanism of said refuse truck when said container is grasped thereby,

the upper end of said lifting arm normally positioned at the approximate level of said rim and engaging said lid whereby when said foot pedal is depressed downwardly, said lifting arm will rise and pivot said lid upwardly to permit refuse to be deposited in said container.

4,892,219

PLUGGING DEVICE

Russell W. Smith, 39 Proctor St., Manchester, Mass. 01944

Continuation of Ser. No. 582,048, Feb. 21, 1984, abandoned. This application Jan. 30, 1989, Ser. No. 303,018
Int. Cl.[4] B65D *51/00*
U.S. Cl. 220—287 **11 Claims**

1. A plugging device utilizable for plugging an aperture in a panel for the stoppage of leaks therethrough, said plugging device comprising:

a sheet of flexible material, said sheet having a central body member and an outer peripheral edge;

a plurality of tapered fingers disposed in said sheet, arranged in a radially directed array outwardly from said central body member of said sheet, said fingers being defined by a plurality of first cleavages arranged at a particular radius from said central body member, said cleavages arranged radially therefrom, said first fingers having a minimum cross-section at their point of attachment to said central body member, out to a maximum cross-section at their

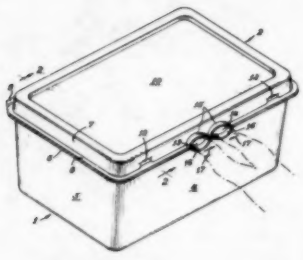
distal ends which comprises the peripheral edge of said sheet, to facilitate a wedging of said plugging device into a cone-like shape when the central body member of said plugging device is first pressed into an aperture.

4,892,220

CONTAINER/DISPENSER FOR WET WIPES AND THE LIKE

Douglas E. Foos, Barrington, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Jun. 30, 1989, Ser. No. 373,511
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—339 **4 Claims**



1. In a thermoformed plastic container/dispenser for wet wipes and the like comprising a rectangular body having an open top, a cover hingedly connected to said body along the top portion of one side of said body and shaped and dimensioned to cover and close the top of said body, horizontal flanges extending outwardly from and along the forward edge portions of at least the fronts of said cover and of said body and engaging each other when said container is closed, and means for releasably holding said cover in position upon said body when said container is closed, the improvement which comprises means operable with one hand for opening said container/dispenser, said means comprising a pair of adjoining arcuate formations opening downwardly in said flange extending from said cover and a second pair of adjoining arcuate formations opening outwardly in said flange extending from said body, said pairs of formations being mutually opposite each other to define adjoining recesses adapted respectively to receive the thumb and finger of a hand whereby to exert upwardly directed force upon said flange extending from said cover to lift and disengage the same from said body in opening said container/dispenser.

4,892,221

DETACHABLE LID CONTAINER

Paul R. Gora, Hartland, and Edward M. Kaucic, Watertown, both of Wis., assignors to Menasha Corporation, Neenah, Wis.

Filed Dec. 6, 1988, Ser. No. 280,777
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—343 **12 Claims**

1. A detachable two-part lid for a container wherein the parts of the lid are held together as a unit when removed from the container yet are hinged separately when attached to the container comprising:

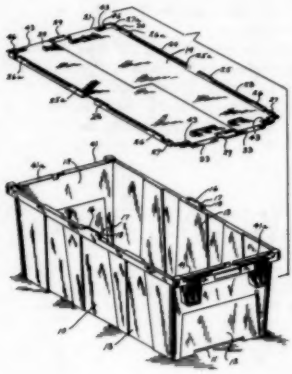
a container having hinge posts extending from an upper portion thereof with an opening in said hinge posts;

a two component lid;

a combined hinge and retention member having opposing ends slidably connected to said lid for positioning said ends in said openings in said hinge posts;

means operatively positioned in connection with said lid to hold said combined hinge and retention member in a first position so that said two components of said lid are held together as a unit; and

means constructed and arranged with respect to said combined hinge and retention member and said lid to retain



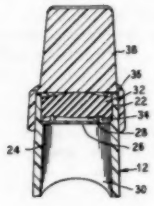
said cover on said container when said combined hinge and retention member is moved from said first position to a second position where said ends engage said opening in said hinge posts and said lid components are hinged to said container.

4,892,222

PORT ASSEMBLY FOR A CONTAINER

Josef Schmidt, Libertyville; James Ducay, Grayslake, both of Ill., and Hugh Forman, Waukesha, Wis., assignors to Baxter International Inc., Deerfield, Ill.

Filed Nov. 25, 1988, Ser. No. 276,274
Int. Cl.[4] A61J *1/00*
U.S. Cl. 220—356 **14 Claims**



1. A port for a container comprising:

an elongated tube extending from a base, the tube defining a tubular bore for receiving means for accessing the container, the tubular bore including a membrane for separating the tubular bore into a first portion and a second portion, the first portion being closer to the container than the second portion, the membrane including a ring extending from the membrane into the second portion of the tubular bore; and

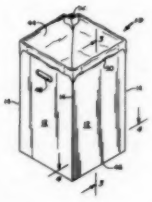
a resealing injection site, the elongated tube including a flange that circumscribes a portion of the resealable injection site to lock the resealable injection site against the ring in the second portion of the tubular bore.

4,892,223

PROCESS OF MAKING A LINED CONTAINER AND THE PRODUCT

David L. DeMent, Millersport, Ohio, assignor to Unipac, Inc., Hebron, Ohio

Filed Nov. 9, 1988, Ser. No. 269,139
Int. Cl.[4] B65D 25/00
U.S. Cl. 220—404 18 Claims



1. A container comprising,
a vertically extending side configured to form a vertically extending fiberboard tube having multiple corners which is open at the top,
a liner bag located in said tube, the liner being closed at the bottom and open at the top,
means for mechanically locking the liner to the upper end of the tube, said locking means comprising at least two horizontal slits through the vertical side,
and spanning at least two of said corners, a score line extending vertically from each end of each slit to the top of the tube, said score lines serving as hinges for the flexing of the strip of sidewall between the slit and the top of the container, the straight line distance between the ends of each slit being less than the length of the slit along the vertical side,
said slits being spaced from said top a distance greataer than about one-half inch when the container is formed of double wall fiberboard and greater than about one and one-half inches when the container is formed of single wall fiberboarad,
the open top of the liner bag extending from inside the tube, over the top of the tube, and down the outside of the tube,
portions of the liner extending from outside the tube, through each of said slits and into the inside of the tube, the portions of the liner extending through said slits being frictionally engaged by the edges of the slits to minimize relative movement between the slit edges and the contacting portion of the liner.

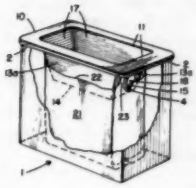
4,892,224

SUPPORT DEVICE FOR A DISPOSABLE TRASH BAG

Donald J. Graham, 63 Driving Park Ave., Lynbrook, L.I., N.Y. 11563

Filed May 6, 1988, Ser. No. 190,998
Int. Cl.[4] B65D 90/04
U.S. Cl. 220—404 1 Claim

1. A trash entry chute device to be placed over the open mouth of a standard rigid top-opening trash container to facilitate the use of standard handled grocery bags, such as limp plastic bags, as disposable liners for the container, comprising a smooth surfaced chute having a collar around the mouth at one end which serves to support the device on the mouth of the container and divert trash into the chute, the chute arranged to extend downwardly and inwardly from the collar for a distance so as to extend into the mouth of a standard grocery bag, the bottom of which rests on the bottom of the container, whereby the grocery bag is held open and facilitates the smooth entry of trash to be disposed into the grocery bag, at least two bag supporting means attached to and in opposed positions on the outside surface of the chute below the flange and shaped to hold the bag by its handles whereby the limp



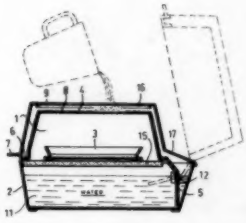
plastic bag is supported inside the container while serving as a disposable liner.

4,892,225

COOLING CONTAINER FOR BUTTER OR THE LIKE

Andreas von Zelewski, Oranienburger Str. 24, and Zenon Kapela, Fürstenberger Str. 41, both of 4000 Düsseldorf 13, Fed. Rep. of Germany

PCT No. PCT/EP87/00113, § 371 Date Nov. 2, 1987, § 102(e) Date Nov. 2, 1987
PCT Filed Feb. 26, 1987, Ser. No. 143,131
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607533
Int. Cl.[4] B65D 00/00
U.S. Cl. 220—408 4 Claims



1. A cooling container for a food stuff, comprising:
an upwardly open receptacle forming a base for said container and adapted to hold a body of water;
a plate disposed above said body of water and mounted in an upper portion of said receptable for receiving a holder for said foodstuff on said plate, said plate having a side thereof covered with an absorbent material and an extension covered with said absorbent material extending downwardly from said plate into said body of water whereby water evaporating from said absorbent cools said foodstuffs on said plate; and
a cover swingably mounted on said receptacle and concave in the direction of said receptacle to enclose said foodstuffs on said plate in a closed position of said cover,
said cover comprising:
an inner wall externally lined with absorbent material and having an extension covered with absorbent material projecting into said receptacle and the body of water therein,
an outer lid spaced from said inner wall and juxtaposed therewith,
a channel interconnecting said outer lid and said inner wall around a portion of the periphery of said cover and adapted to direct flow of water introduced between said outer lid and said inner wall into said receptacle whereby water evaporating from the absorbent material

on said inner wall cools said foodstuff in said closed position of said cover,

perforations formed in said outer lid and communicating with the space between said outer lid and said inner wall for enabling evaporation from the absorbent material lining said inner wall and pouring of water through said perforations into said space for passage into said receptacle, and

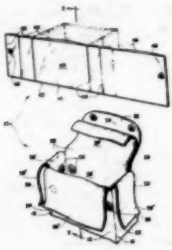
a peripherally extending drip edge around an upper part of said outer lid projecting downwardly in a closed position of said cover, and a cover cap extending outwardly from said outer lid at a rear portion of said container, said extension of said inner wall articulating said cover on said receptacle, said channel being formed at a front of the container with a handle.

4,892,226

PORTABLE APPARATUS FOR REFRIGERATED STORAGE AND TRANSPORTATION OF COSMETICS AND THE LIKE

Nooral S. Abtahi, 1400 Barton Rd., #109, Redlands, Calif. 92373

Filed Aug. 17, 1988, Ser. No. 233,066
Int. Cl.[4] B65D *85/72*
U.S. Cl. 220—412 **13 Claims**



1. A portable apparatus for refrigerated temporary storage and transportation of heat-sensitive cosmetics and the like, comprising:

a. A closable case having wall means defining an interior receiving area for cosmetics and like items;

b. a refrigerant pack conformable to said wall means of said case for selective insertion and removal therefrom; and

c. means for generally enclosing said refrigerant pack when conformed to and inserted in said case, said enclosing means having an absorbent surface for absorption of condensation from said refrigerant pack comprising a first web of an absorbent sheet material affixed to said wall means within said interior receiving area and a second web of said absorbent sheet material movable with respect to said first web to be foldable into and out of covering relation to said refrigerant pack when said refrigerant pack is inserted into said receiving area.

4,892,227

HIGH BARRIER PLASTIC CONTAINER AND METHOD OF MAKING SAME

Donald N. MacLaughlin, Midland, Mich., assignor to Packaging Resources Incorporated, New Vienna, Ohio

Filed Apr. 21, 1988, Ser. No. 184,278
Int. Cl.[4] B65D *25/14*
U.S. Cl. 220—450 **18 Claims**

1. A high barrier container comprising:

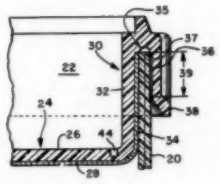
a barrel shaped gas-impermeable plastic container body having an open end and a closed end;

a container closure member comprising a top plastic layer including a circular central closure panel covering the opening in said container body and a peripheral annular plastic flange formed as an integral component thereof; and

a gas-impermeable barrier layer bonded to the bottom of said plastic central closure panel;

wherein said closure member is spin-welded to said open end of said container body such that a spin-weld interface is formed directly between said container body and said peripheral flange.

15. A method of forming a high barrier container comprising the steps of:



forming a plastic closure member having a central circular closure panel and an integral peripheral annular flange;

bonding a gas-impermeable barrier shield to said central closure panel;

forming a barrel shaped gas-impermeable plastic container body having an open end and a closed end; and

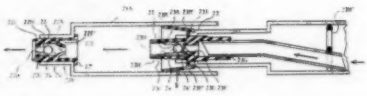
spin-welding said closure member to said container body such that a spin-weld interface is formed directly between said container body and said flange.

4,892,228

TOY WATER GUN

Hiroshi Yano, Moriguchi, Japan, assignor to Sekiden Co., Ltd., Osaka, Japan

Continuation of Ser. No. 636,243, Jul. 31, 1984, Pat. No. 4,784,293. This application Jul. 29, 1988, Ser. No. 226,082
Claims priority, application Japan, Aug. 3, 1983, 58-142010
Int. Cl.[4] F41B *9/00*
U.S. Cl. 222—79 **2 Claims**



1. In a toy gun for projecting a fluent material and having a front gun body and a hollow rear gun body of rigid material, one having a cylinder means as a part thereof and the other having a piston means as a part thereof, said piston means being slidable in said cylinder means for permitting movement of the gun bodies toward and away from each other, spaced apart grip means on the respective gun bodies projecting laterally thereof for gripping said bodies for relatively moving them for moving said piston means back and forth in said cylinder means, guide means on one of said gun bodies slidable along the other of said gun bodies for guiding said gun bodies in the direction of the longitudinal axes of said piston and cylinder means, stop means on the other of said gun bodies along the path of movement of the one body and the guide means and being engageable with the stop means when the gun bodies are substantially at the end of the movement of the gun bodies away from each other for preventing the gun bodies from coming apart, and nozzle means on the one of said piston means and cylinder means which is forwardmost, an improved valve means comprising:

a first one way valve means connected to said nozzle means on the forwardmost of said piston means and cylinder

means and having a first hollow main body of soft elastic material with a nozzle integrally formed on the front end thereof and having a smooth conical shape converging forwardly of said main body, with a valve stop within said first hollow main body around said nozzle, with a first valve seat integrally formed on the rear end thereof having a first flow passage therethrough having a wall with a rearwardly converging smooth conical shape, and with a first valve body within said first hollow main body movable against said conical shape wall during movement of said piston means and said cylinder means away from each other and movable away from said first valve seat and against said valve stop during movement of said piston means and cylinder means toward each other; and

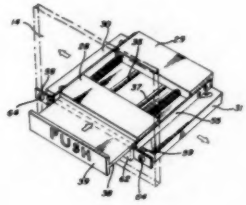
a second one way valve means on the one of said piston means and cylinder means which is rearmost and having a second hollow main body of soft elastic material with a second flow passage at the forward end thereof, with a furter valve stop within said second hollow main body around said second flow passage, with a second valve seat integrally formed on the rear end thereof having a further flow passage therethrough, and with a second valve body within said second hollow main body and movable against said second valve seat during movement of said piston means and said cylinder means toward each other and movable away from said second valve seat and against said further valve stop during movement of said piston means and said cylinder means away from each other.

4,892,229

SYSTEM FOR DISPENSING LIQUID FROM A PAPERBOARD CARTON

Arthur G. Rudick, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 24, 1988, Ser. No. 236,183
Int. Cl.[4] B65D *35/56*
U.S. Cl. 222—105 **15 Claims**



1. Apparatus for dispensing a liquid from a carton-type liquid container having a flexible reclosable opening located at one corner thereof, comprising:

means for holding the container so that the opening at the corner is located at the bottom during normal use whereby liquid can be dispensed by gravity downwardly through the opening; and

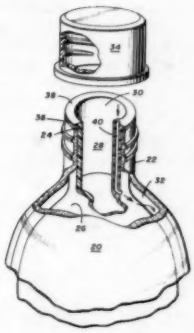
means located on said holding means for controlling the opening and closing of the opening and thus the dispensing of liquid from the container, said controlling means comprising a pinch mechanism including mutually perpendicular adjacent pairs of pressure plates having mutually opposing parallel side wall surfaces for engaging and compressing respective pairs of opposite walls of the container at the opening, and means for interconnecting said pairs of plates to move in unison and mutual opposition and thereby alternately open and close the opening at the corner during a dispensing operation.

4,892,230

CARBONATED BEVERAGE BOTTLE

Arthur E. Lynn, Jr., Rte. 7, Box 218-A, Andalusia, Ala. 36420

Continuation-in-part of Ser. No. 152,987, Feb. 8, 1988, abandoned. This application Sep. 14, 1988, Ser. No. 244,111
Int. Cl.[4] B65D *35/56*
U.S. Cl. 222—105 **2 Claims**



1. An improved container for storing and dispensing a carbonated liquid, said container comprising:

a. a substantially rigid outer container in the form of a bottle having a neck extending upwardly to a bottle mouth defined by an annular upper rim, said bottle being otherwise imperforate;

b. an inner collapsible pouch disposed within said bottle for containing said liquid, said pouch being formed from a substantially non-elastomeric material which is impervious to liquids and to carbon dioxide gas, said pouch having a neck extending upwardly through said neck of said bottle and being otherwise imperforate to thereby define with said bottle an air space between said pouch and said bottle, said neck of said pouch terminating in an upper open mouth whereby said liquid may be poured from said pouch;

c. cap means for closing said open mouth; and

d. valve means for admitting air from the ambient atmosphere outside said improved container into said air space when said cap means is removed from said pouch and for isolating said air space both from the interior of said inner pouch and from said ambient atmosphere when said cap means is installed, whereby said air inside said air space is compressed by carbon dioxide escaping from said liquid while said cap means is installed.

4,892,231

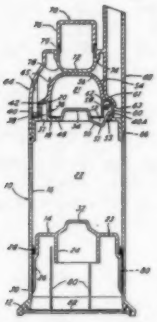
PUMP CHAMBER DISPENSER

Martin F. Ball, Wantage, England, assignor to Metal Box p.l.c., Reading, England

Continuation of Ser. No. 73,747, Jul. 15, 1987, Pat. No. 4,830,229. This application Oct. 31, 1988, Ser. No. 265,031
Claims priority, application United Kingdom, Jul. 16, 1986, 8617350
Int. Cl.[4] B67D *5/42*; G01F *11/00*
U.S. Cl. 222—207 **22 Claims**

1. A pump chamber dispenser for viscous or pasty product, comprising a body including a tubular side wall and an end wall panel integral with the side wall, a closed reservoir chamber within the body for receiving viscous or pasty product to be dispensed, the chamber being defined partly by said end wall panel, a piston within the chamber to move the viscous or pasty product toward said end wall panel, a unitary pumping member of elastomeric material mounted on the end wall panel outside of the reservoir chamber and confining with the end

wall panel a variable volume pump chamber, the pumping member including integral inlet and exit valve elements, an inlet port for conducting product to the pumping chamber from the reservoir chamber and an exit port for conducting product from the pumping chamber to a discharge nozzle, the inlet and exit ports being controlled by the inlet and exit valve elements, respectively, said end wall panel having a substantially annular projection directed away from the reservoir chamber and extending around an axis substantially parallel to the longitudinal axis of the body, the projection having inner and outer substantially cylindrical surfaces and a portion of said end wall panel surrounds said projection with the portion of said end wall panel being substantially planar, and said pumping member being rotationally symmetrical about an axis substantially parallel to the longitudinal axis of the body and having a domed portion and inner and outer coaxial skirts extending from the edge of the domed portion and forming



said inlet and exit valve elements, respectively, said skirts lying against said radially inner and outer surfaces of said projection with said outer skirt extending from the domed portion toward but terminating before the substantially planar portion of said end wall panel, said inlet port extending through the end wall panel from said groove to said radially inner surface of the projection, and said inlet port being closable by the inner skirt, a recess provided in said end wall panel and extending across the projection to define said exit port, the exit port communicating with the pumping chamber and opening at the said radially outer surface of the projection at a position to be closable by the outer skirt, and a cover member fixed to the body by a snap connection and including said discharge nozzle, the cover member having a movable part for acting on the domed portion of the pumping member to reduce the volume of the pumping chamber, and being arranged to enclose the pumping member during operation of the pump dispenser.

4,892,232

UNIT DOSE DISPENSER

James H. Martin, 8322 County Line Rd., Burr Ridge, Ill. 60521

Filed Jul. 25, 1988, Ser. No. 225,081

Int. Cl.[4] B65D *37/00*

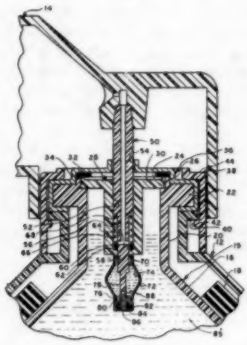
U.S. Cl. 222—207 **4 Claims**

1. Dispensing apparatus for dispensing a predetermined quantity of fluid, comprising in combination

first elastomeric reservoir means for containing a supply of said fluid under pressure,

second elastomeric reservoir means disposed within said first reservoir means,

manually operable fluid dispensing means for communicating said first reservoir to said second reservoir when in a first position to permit fluid from said first reservoir to flow into said second reservoir; and when in a second position for sealing said reservoirs from one another and communicating said second reservoir to a location which is exterior of both said reservoirs to permit fluid in said second reservoir to escape therefrom at said pressure, and said manually operable fluid dispensing means includes



means responsive to the movement of said dispensing means from said first position to said second position for applying a mechanical force to compress said second reservoir.

4,892,233

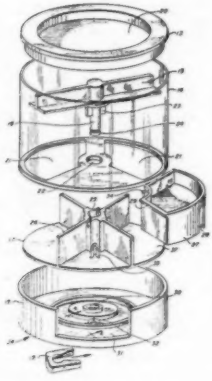
DISPENSING APPARATUS

Barry M. Zelickson, 1309 Westwood Hills Rd., St. Louis Park, Minn. 55426

Filed Jun. 21, 1988, Ser. No. 209,487

Int. Cl.[4] G01F *11/00*

U.S. Cl. 222—226 **18 Claims**



1. A measuring and dispensing device for dispensing granular material wherein the device comprises

a canister for storing and dispensing material therefrom, said canister further having top and bottom ends wherein the bottom end includes at least one dispensing opening, said dispensing opening being in flow communication with at least one removable drawer, said drawer being positioned in a rotatable drawer holder, said drawer holder and drawer being substantially enclosed and rotatable within a dispenser housing, and

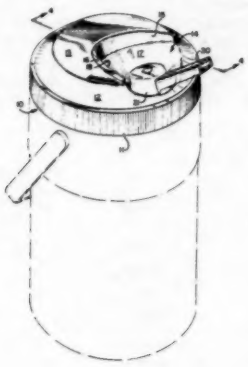
a mixing lever in said canister and said mixing lever being in rotational engagement with said drawer holder so that when said drawer holder is rotated, said mixing lever rotates.

4,892,234

COMBINED CLOSURE AND POURING SPOUT

Mark H. Bennett, Winfield, Kans., assignor to Gott Corporation, Winfield, Tex.

Filed Jul. 21, 1988, Ser. No. 222,621
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—484 6 Claims



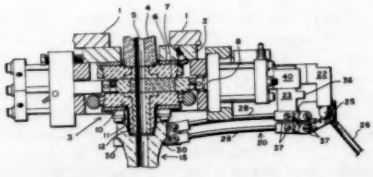
1. In a dispenser closure for a container, said closure comprising a normally vertical axis, a downturned peripheral flange, an upper top wall connected to said downturned peripheral flange by an arcuate wall thereby defining an upwardly open off-center recess in the top of the closure, a hollow mounting base within said recess having its axis inclined inwardly toward said closure axis, a pouring spout member adapted to be mounted in said recess on said mounting base for lateral rotation from a closed position wholly within said recess to an upwardly inclined open position projecting outwardly beyond the closure, an opening in said mounting base, an inner channel within said pouring spout which registers with said opening when said spout member is in said open position, a vent aperture in said spout member, and a vent tube depending from said mounting base which communicates with said vent aperture when said spout member is in said open position, thereby facilitating pouring through said spout member when the closure is tilted from its normally vertical axis and inhibiting drippage when returning the closure to its upright position.

4,892,235

JOINT AND SHROUD SUPPORT FOR POUR TUBE AND COLLECTOR NOZZLE

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Jun. 23, 1988, Ser. No. 210,577
Int. Cl.[4] B22D *37/00*
U.S. Cl. 222—607 3 Claims



1. A combination shroud to slide gate collector nozzle joint for use in a sliding gate valve construction for teeming metal, such combination including bullet-shaped metal encased collector nozzle at the lower portion of said valve,

a shroud formed of a refractory,

said shroud having a body portion which is essentially tubular,

said tubular body portion having a shroud orifice extending downwardly,

an open end portion at the upper portion of said shroud,

said open end portion having a refractory faced sealing cup with frustoconical sidewalls,

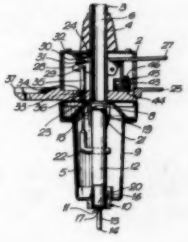
said shroud having means at its upper end for receiving a support ring for urging said shroud in contact with a bullet-shaped nose of the collector nozzle.

4,892,236

DISPENSING MEASURES

Ronald S. Griffiths, Rochester, and John E. Searles, Aylesford, both of England, assignors to R. and A. Bailey & Company Limited, United Kingdom

Continuation of Ser. No. 60,001, Jun. 9, 1987, abandoned. This application Jan. 18, 1990, Ser. No. 298,305
Claims priority, application United Kingdom, Jun. 10, 1986, 8614046; Jan. 28, 1987, 8701912
Int. Cl.[4] G01C *1/12*; G01F *11/28*
U.S. Cl. 222—640 11 Claims



1. A dispensing measure for dispensing fluids having a head assembly with means for engagement with the neck of a bottle, a measuring chamber having an entry port and an exit port, an internal operating standard, an outlet portion at the exit port having a cylindrical internal wall, the internal operating standard having a bottom portion consisting essentially of a cylindrical portion and a nose portion smaller in diameter than said cylindrical portion, and additionally a means to move the internal operating standard alternately between a dispensing position in which it seals the entry port and a resting position in which it seals the exit port, the cylindrical portion having a cylindrical external surface which fits slidably and sealingly within the cylindrical internal wall of the outlet portion for wiping clean the entire internal wall of the outlet portion as the internal operating standard returns to its resting position after dispensing, the nose portion having an external surface for guiding fluid flow, only the nose portion extending beyond the outlet portion externally of the measuring chamber, and the external surface of the nose portion being entirely external to the measuring chamber when in said rest position, whereby fluid being dispensed from the measuring chamber flows through the exit port, and on the external surface of the nose portion and then directly into a receptacle held beneath the dispensing measure.

4,892,237

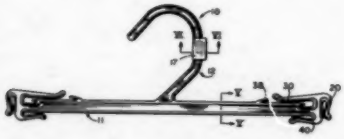
INTIMATE APPAREL HANGER WITH GARMENT CLAMPING ARMS

Everett L. Duester; Russell O. Blanchard, and Robert A. Bredeweg, all of Zeeland, Mich., assignors to Batts, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 181,388, Apr. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 108,227, Oct. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 49,276, May 13, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 270,271

Int. Cl.[4] A47G *25/48*

U.S. Cl. 223—85 32 Claims



1. A garment hanger having an elongated body and supporting hook means midway between the ends of said body, the opposite ends of said body being identical and each comprising: a first arm at the body's outer end spaced from and overlying the top of and integral with said body, said arm forming a garment receiving first slot between the arm and the body; an upwardly and outwardly inclined finger having an outer end spaced from the inner end of said arm for defining an upwardly opening entrance to said slot; a downwardly extending second arm at the end of the body integral with the body at its upper end, said second arm forming a downwardly opening second garment receiving slot; a third arm extending toward the center of said body adjacent the lower edge of said body, said third arm being integral with the end of said body and forming a third garment receiving slot extending along the body's lower edge; the entrances to said slots formed by said first, second and third slots each being narrower than the inner portions of said slots to cause clamping of garments seated in said slots.

4,892,238

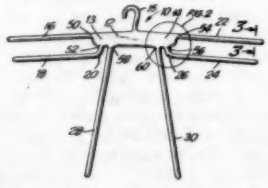
CLOTHES PRESS HANGER

Dorothy Pinczowski, 2090 Main St., Highland Falls, N.Y. 10928

Filed Jun. 7, 1989, Ser. No. 362,875

Int. Cl.[4] A47G *25/14;* A47B *61/02*

U.S. Cl. 223—92 20 Claims



1. A clothes press hanger comprising:

a body member having shoulder portions on opposite sides thereof;

a hook member extending upwardly from a center of a top portion of said body member between said shoulder portions;

a first pair of arms extending outwardly from one side of said body member, said arms being spaced apart;

a second pair of arms extending outwardly from an opposite side of said body member, said arms of said second pair being spaced apart; and

means for permitting said first pair of arms to be bent and spread apart from each other, and for also permitting said second pair of arms to be bent and spread apart from each other, in order to press a garment hanging on said hanger into shape to avoid any creasing and wrinkling thereof.

4,892,239

DEVICE FOR MAKING IT EASIER TO PUT ON ARTICLES OF CLOTHING

Walter Tomasi, Weilheimer Str. 21, D-7890 Waldshut/Tiengen, Fed. Rep. of Germany

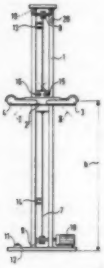
PCT No. PCT/DE88/00317, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09637, PCT Pub. Date Dec. 15, 1988

PCT Filed May 28, 1988, Ser. No. 305,987

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1987, 3718330

Int. Cl.[4] A47G *25/90*

U.S. Cl. 223—111 15 Claims



1. A device for making it easier to put on articles of clothing, such as coats, jackets or the like, with a holding device for the articles of clothing which is mounted so as to be of adjustable height on a vertical guide (1) by means of a connecting element (2), wherein the holding device has two half-hangers (3, 4) articulated on the connecting element (2) by means of hinges (5, 6) the axial directions (I, II) of the hinges (5, 6) intersecting at an angle above the holding device, and the half-hangers (3, 4) being tiltable about the said axial direction (I, II) approximately horizontal, oppositely aligned first end position forwards away from the vertical guide (1) into a second end position, and wherein a drive (7–10) actuable by the person putting on the particular article of clothing is provided for varying the height (h) of the holding device on the vertical guide (1).

4,892,240

EXOSKETETAL CARRIAGE FOR ARTICLES TO BE CARRIED BY A PERSON

Michael S. Bell, 354 Daytona, Goleta, Calif. 93117

Filed May 8, 1987, Ser. No. 47,807

Int. Cl.[4] A45F *3/04*

U.S. Cl. 224—211 17 Claims

1. An exoskeletal carriage to be worn on the human body to support and to carry objects attached thereto, said carriage comprising:

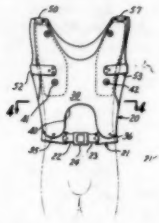
a belt at least partially to encircle the waist of a wearer, said belt being flexible and conformable to said waist, and adapted to be tight enough as not to slip downwardly appreciably under the vertical loads intended to be applied to it;

a front blade-like columnar member and a rear blade-like columnar member adapted to be placed to the front and to the rear of the wearer, above the waist;

attachment means attaching said columnar members to said belt so that they are supported by said belt;

each said columnar member comprising a blade like structure having a substantial area with a substantial vertical

and horizontal dimension, and with a dimension of thickness and physical properties which render the member at least stiffly flexible, both of said columnar members; when on the body having a channel shape along at least a portion of their vertical dimension; and both of said columnar members covering substantial areas of the front and rear portions of the upper torso extending to each side of the torso of the wearer; whereby when attached to the belt



and weighted downwardly by objects supported by it, the members behave as a columnar support with no more than minimal columnar bending; and

connector means joining said front and back columnar members at a location above said belt to resist their separation, whereby articles may be mounted to said columnar members for carriage by the wearer and be principally supported by said belt.

4,892,241

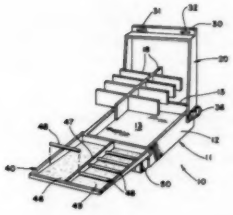
TACKLE BOX

Gus H. Mavrakis, 135 Burlington Ave., Billings, Mont. 59101

Filed Aug. 10, 1988, Ser. No. 230,609

Int. Cl.[4] A45F *3/04*; B65D *25/10*; A01K *97/06*

U.S. Cl. 224—216 **5 Claims**



1. A tackle box, comprising:

a cover and support member having a front wall, opposite side walls and a back wall;

means on the support member for securing the support member on the body of a user near the front of the user's waist;

a first receptacle having front, back, side and bottom walls and pivotally mounted at the back wall to a bottom edge of the support member for movement between an upwardly pivoted closed position disposed against the support member and an open position pivoted downwardly to a generally horizontal orientation in front of the support member;

a supplemental cover and shelf member having a first wall, opposite side walls and a back wall defining a shallow tray and wherein at least said opposite side walls have flat inner surfaces, said member pivotally mounted at a back edge thereof to the front wall of the receptacle and movable between a first position disposed in closed, overlying relationship to the receptacle and a second position disposed in open, generally horizontal position extending outwardly from the front wall of the receptacle;

a second receptacle secured on the front wall of the first receptacle in a position to be accessible to the user when the first receptacle is in its closed position relative to the cover and support member; and

a plurality of removable elongate rods frictionally held in the tray in spaced relationship to one another for releasably holding flies, hooks and other articles in the tray, said rods having opposite flat ends wedged between the flat inner surfaces of the opposite side walls of said tray thereby being held in position solely by tight frictional engagement between said ends of the rods and said opposite sides of the tray.

4,892,242

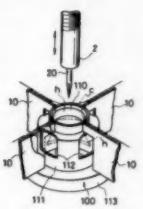
METHOD AND DEVICE FOR SEPARATING TRIMMING LOSSES OF PRODUCTS FORMED FROM SHEET

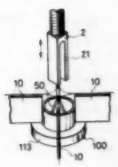
Osamu Tanida, Nara; Yoshiharu Okuno, Kyoto; Katsuhiko Yoshida, Nara; Nobuyasu Sakamoto, Nara; Hsao Ishikawa, Nara, and Eiichi Kobayashi, Nara, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Jan. 13, 1988, Ser. No. 143,478

Int. Cl.[4] B26F *3/02*

U.S. Cl. 225—2 **14 Claims**





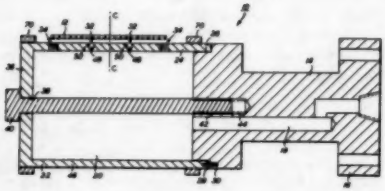
10. A device for separating trimming losses from a sheet having a plurality of products formed thereon with star-shaped scraps therebetween, said device comprising: a sheet supporting plate; a plurality of pushing rods, each pushing rod having a free end for contacting and pushing a corresponding said star-shaped scrap, said pushing rods and said sheet supporting plate being disposed on opposite sides of said sheet; a plurality of bush means fixed to said sheet supporting plate, each bush means corresponding to one of said pushing rods, wherein each bush means has a cylinder portion and a cutter means positioned in said cylinder portion, and wherein each pushing rod has a groove having a thickness greater than a thickness of said cutter means, and wherein each of said pushing rods pushes a corresponding star-shaped scrap onto said cutter means and through said cylinder portion; and collection chamber means positioned on the side of said sheet supporting plate opposite to said sheet, wherein said star-shaped scraps are collected in said collection chamber after being pushed through said pushing cylinder means by said pushing rods.

4,892,243

AIR-BEARING CENTER-GUIDING APPARATUS AND METHOD

Michael Long; Thomas W. Palone, both of Rochester, and Paul Kemp, Churchville, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,224
Int. Cl.[4] B65H *23/24, 23/32*
U.S. Cl. 226—97 **22 Claims**



1. A method for supporting and laterally center-guiding a thin web along a longitudinally extending web center line wherein the web has longitudinally extending side edges defining a predetermined web width, comprising the steps of:

providing a web-support member having an outer web-facing surface;

providing a pair of parallel, longitudinally extending rows of elongated guide apertures extending through said web-facing surface, said guide apertures being arranged in longitudinally spaced-apart relation in each row, said rows being laterally spaced apart a distance substantially equal to the predetermined width of the web being guided, each guide aperture further extending through said web-facing surface in a direction substantially perpendicular to the web and defining in cross-section an elongated aperture having a straight side and a curved side with one of said sides substantially in register with a side edge of said web and the other of said sides extended beyond said side edge, whereby each said elongated guide aperture is positioned substantially beyond said width of said web;

providing web-support means separate from and interposed between said rows of guide apertures; and

directing a source of pressurized air (1) to said web-support means for forming an air cushion below the web for supporting the web on the air cushion and (2) to said elongated guide apertures for directing jets of air against the web edges for forming localized web-guiding deformations on the web edges for laterally center-guiding the web along the web center line.

4,892,244

SURGICAL STAPLER CARTRIDGE LOCKOUT DEVICE

William D. Fox, New Richmond; Rudolph H. Nobis, Cincinnati; Richard P. Nuchols, Beavercreek, and Mark S. Zeiner, Cincinnati, all of Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 7, 1988, Ser. No. 267,907
Int. Cl.[4] A61B *17/10*
U.S. Cl. 227—8 **12 Claims**

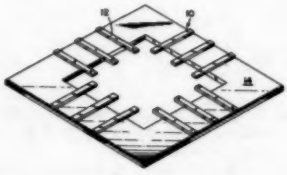
1. In a surgical stapler having firing means for firing staples and in which a removable cartridge containing staples may be loaded and replaced by another removable cartridge, a lockout mechanism on said stapler actuable by said firing means upon the firing of said staples by said stapler such that said lockout mechanism blocks said firing means and prevents the refiring of said stapler when loaded with said spent cartridge.

4,892,245

CONTROLLED COMPRESSION FURNACE BONDING

Thomas J. Dunaway, St. Louis Park; Richard K. Speilberger, Maple Grove; Jerald M. Loy, Anoka; Lori A. Dicks, New Hope, and Luverne O. Balgaard, Burnsville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 21, 1988, Ser. No. 274,431
Int. Cl.[4] B23K *31/02, 37/04*
U.S. Cl. 228—180.2 **19 Claims**



1. A system for controlled compression furnace bonding of a semiconductor chip to conductive elements of a leadframe, comprising:

(a) holding means comprising a holding member having a chip support surface for supporting a semiconductor chip;

(b) positioning means for precisely positioning conductive elements of a leadframe with corresponding bonding locations on the semiconductor chip, the positioning means comprising:

(i) standoff means for maintaining vertical distance between the leadframe conductive elements and the semiconductor chip bonding locations;

(ii) planar gravity means comprising an insert placed on top of the leadframe for providing controlled compression force against leadframe conductive elements so that all leadframe conductive elements are in conductive connection with corresponding semiconductor chip bonding locations; and

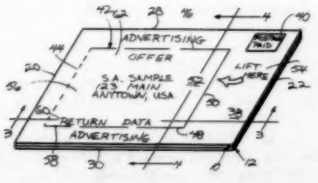
(c) furnace heating means comprising a furnace for heating and conductively bonding the conductive elements with the chip bonding locations.

4,892,246

POSTCARD WITH TEAR OUT RETURN POSTCARD

John A. Norman, Downers Grove, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Jan. 6, 1989, Ser. No. 293,977
Int. Cl.[4] B42D *15/04*
U.S. Cl. 229—92.8 **10 Claims**



1. A business form including a postcard mailing piece comprising:

first and second superimposed plies, each of card stock like

that employed in postcards and having generally identical sizes and shapes;

means joining the peripheries only of said plies to hold the same in substantial abutment with each other;

a first franking designation or stamp receiving area on the side of one of said plies remote from the other of said plies;

a closed line of weakening in said one ply defining the periphery of a return postcard and located to be spaced from and within said joining means and not encompassing said first franking designation or stamp receiving area; and

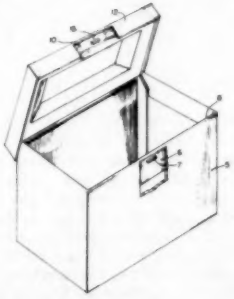
a second franking designation or stamp receiving area on said one ply on the side thereof facing said other ply within said closed line of weakening to be on said return post card.

4,892,247

PAPERBOARD CARTON WITH LATCHING PLASTIC LID

Robert S. Dirksing, and Theodore P. Merz, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 19, 1988, Ser. No. 234,233
Int. Cl.[4] B65D *43/16*
U.S. Cl. 229—125.26 **14 Claims**



1. A package comprising:

(a) a paperboard carton having an open end and including a multiplicity of interconnected sidewalls, each of said sidewalls having an innermost and an outermost surface, at least one of said sidewalls including a folded over flap at said open end of said carton, said flap including at least one aperture therein;

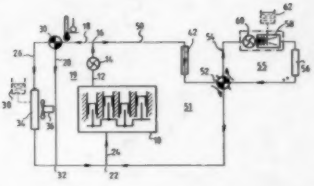
(b) a plastic lid having a periphery exhibiting a shape generally corresponding to the open end of said paperboard carton, said lid including a "U" shaped channel having an innermost and an outermost surface at its periphery in an area corresponding with said at least one sidewall including said apertured folded over flap, said innermost surface of said "U" shaped channel including a projection which is complementary to said aperture in said flap, said projection being located on the surface of said "U" shaped channel which faces said flap when said lid is in the closed position, said projection being so positioned that it enters into the aperture in said flap when said lid is in its closed position, said lid further including means for hingedly connecting it to one of said sidewalls of said paperboard carton other than the sidewall joined to said flap which includes said aperture, whereby said projection on said "U" shaped flange flange and said hole in said flap form a detenting latch to hold said lid in its closed position once said projection has entered said aperture.

4,892,248

HEATING INSTALLATION COMPRISING A HEAT GENERATOR, INTENDED FOR AN AUTOMOBILE

Roger Robin, Elancourt; Jean-Francois Somme, Chaville, and Jean-Francois Bouvot, Dampierre, all of France, assignors to Valeo, Paris, France

Filed May 20, 1988, Ser. No. 196,466
Claims priority, application France, May 21, 1987, 87 07158
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 B **13 Claims**



1. A heating system for use in a vehicle comprising a coolant fluid circulation system including primary and secondary heating circuits, said primary circuit including a primary heat exchanger and the engine as a primary heat generator, said secondary heat circuit including a secondary heat exchanger positioned to heat the air to the passenger area of the vehicle, said secondary heat circuit further including a secondary heat generator responsive to the operation of said engine to raise the temperature of the coolant contained in said secondary heat exchanger, said primary and said secondary heating circuits being selectively connectable to and isolated from each other at engine start to accelerate the increase in the temperature of the coolant fluid in said secondary heat exchanger.

4,892,249

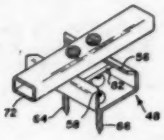
RAILROAD GRADE CROSSING WITH IMPROVED TRANSVERSE SPLINE AND ANCHORING ASSEMBLY

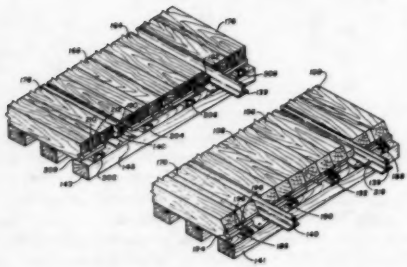
S. Hudson Owen, Marshfield, Wis., assignor to Koppers Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 863,416, May 15, 1986, Pat. No. 4,732,320. This application Mar. 21, 1988, Ser. No. 170,527
Int. Cl.[4] E01B *21/04*
U.S. Cl. 238—8 **14 Claims**

1. A railroad crossing comprising rails supported by ties on a ballast and a deck of gage and outer field panels supported by said ties adjacent to said rails, said panels being substantially level with the top of said rails so as to allow motor vehicle traffic to cross over said rails, the improvement which comprises joining panels by means of transverse splines fitted into indentations on end surfaces of said gage and outer field panels whereby pairs of panels are joined together with one of said splines fitting partly into each end of adjoining panels; and lateral anchor means comprising a floor section fixed to one of said ties and vertical wall sections projecting upwardly from said floor section in transverse relation to on of said splines such that said spline rests on the upper terminal ends of said wall sections and said wall sections having opposed inwardly projecting horizontal lips and a spline retaining plate positioned beneath said lips and fastening means connecting said

spline and said spline retaining plate so as to thereby fix the gage panels adjacent to said rails, and outer field panels





whereby the need is obviated for affixing the panels to the ties by means of surface spikes.

4,892,250

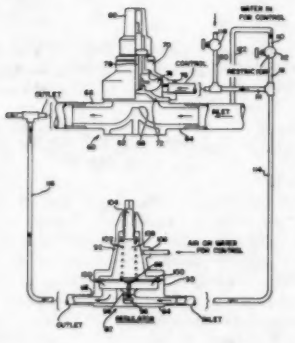
DYNAMIC FOUNTAIN DISPLAYS AND METHODS FOR CREATING THE SAME

Mark W. Fuller, Studio City, and Alan S. Robinson, El Monte, both of Calif., assignors to Wet Enterprises, Inc., Universal City, Calif.

Continuation-in-part of Ser. No. 106,533, Oct. 6, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 334,781

Int. Cl.[4] F21P *7/00*

U.S. Cl. 239—18 **17 Claims**



11. A patio fountain comprising:

a base extending over an area, the said base including drain means for collecting water from above for recirculation;

a patio deck supported above said base, said patio deck having a plurality of deck members supported adjacent to each other in slightly spaced apart relationship for allowing water to pass therebetween to said vase;

at least one nozzle disposed to direct water upward through at least one opening in said patio deck; and,

pump means coupled between said drain means and said at least one nozzle for recirculating water collected by said base;

whereby a water fountain display is formed utilizing open joint paving and without using one or more fountain pools.

4,892,251

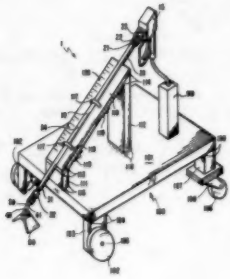
LINE MARKING DEVICE

Harrison Bresnen, 571 Elbridge Rd., Morrisville, Pa. 19067

Filed Nov. 14, 1988, Ser. No. 270,662

Int. Cl.[4] E01C *23/16*; **B05B** *15/06*

U.S. Cl. 239—150 **3 Claims**



3. A surface marking device adapted to mark a guide line or stripe upon the surface of a road or pavement for installation of parking lines and traffic markings, comprising in combination, airless paint spray power system, airless paint spray mechanism, and wheel-mounted paint spray mechanism support carrier; said airless paint spray mechanism including airless paint spray gun, hollow extension pole, nozzle angle head assembly, and paint spray nozzle, wherein said airless paint spray gun is attachable to said airless paint spray power system by suitable first connection means and to one end of said extension pole by suitable second connection means; wherein said nozzle angle head assembly is attachable to the opposite end of said extension pole by suitable third connection means and to said paint spray nozzle by suitable fourth connection means; said paint spray mechanism being supported above the surface of said road or pavement by said support carrier in a manner having said airless paint spray gun upwardly disposed to the rear of said support carrier and said paint spray nozzle downwardly disposed to the front of said support carrier toward the surface of the road or pavement to be marked, wherein said paint spray mechanism support carrier generally comprises a substantially flat support carrier lower table, and a support carrier upper table downwardly inclined from rear to front; said lower table being supported at its front edge by offset wheels, each wheel being rotatably attached to wheel support frame by means of wheel bolt, said wheel support frames extending vertically on each side of said lower table from the bottom wall surface of said lower table in vertical alignment with the side walls of said lower table, being attached thereto by weld means; said lower table being supported at its rear edge by casters, each caster being rotatably attached to a caster housing, said caster housing being attached to a caster frame in a manner to permit swivel rotation of the caster, said caster frames extending vertically on each side of the lower table from the bottom wall surface of said lower table, being attached thereto by weld means; said upper table being supported along the longitudinal axis of said carrier lower table by means of a front upper table support frame and a rear upper table support frame, said front upper table support frame being

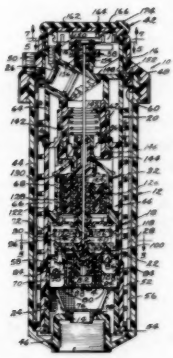
formed at a suitably shorter length than said rear upper table support frame to achieve the desired downward inclination of the carrier upper table from rear to front, said carrier upper table extending from the front edge of said front upper table support frame to the rear edge of said rear upper table support frame, said front upper support frame and said rear upper table support frame being attached to the carrier upper table by weld means at the bottom surface of said upper table, and being attached to carrier lower table by weld means at the top surface of said carrier lower table said upper table having bolt holes formed therein to one side of the area disposed for receipt of said paint spray mechanism, said paint spray mechanism being held in place by means of "J" bolts having threaded ends and which extend through said upper table bolt holes, said "J" bolts being secured by means of wing nuts, said wing nuts being threaded complimentarily with the threads of said "J" bolts for threadedly engagement and cooperation therewith; said support carrier including a suitably graduated scale on the top surface of said carrier upper table to facilitate adjustment of said paint spray mechanism to mark guide lines or stripes of varying widths.

4,892,252

ADJUSTABLE PART CIRCLE SPRINKLER ASSEMBLY

Kenneth J. Bruninga, Mapleton, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Nov. 3, 1988, Ser. No. 266,532
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—205 **34 Claims**



1. An adjustable part circle sprinkler assembly comprising

a sprinkler body structure having inlet means for communication with a source of water under pressure,

a sprinkler head structure mounted on said sprinkler body structure for rotational movement about an upright axis either in one direction or an opposite direction,

means defining a sealed flow path for water under pressure communicated with said inlet means including outlet means in said sprinkler head structure for discharging the water in an upwardly and outwardly extending stream formation so as to be dispersed in an instantaneous generally segmental ground pattern within a circular ground pattern,

said flow path defining means including means defining an annular chamber and reversible flow directing means mounted in said sprinkler body structure for movement between (1) a first position for directing water in said flow path into said chamber in one annular direction and (2) a second position for directing water in said flow path into said chamber in an opposite annular direction,

an impeller mounted in said chamber for rotation by the flow of water in said chamber in a direction corresponding to the annular direction of movement of the water into said chamber,

a meshing gear speed reduction assembly drivingly connected with said impeller and including a rotary output member rotatable in a direction commensurate with the direction of rotation of said impeller and at a speed commensurately less than the speed of rotation of said impeller, the operation being such that said output member cannot be rotationally moved when said impeller is stationarily inoperable,

slip clutch means operatively connecting said rotary output member with said sprinkler had structure for (1) normally operable rotational movement commensurate with the rotational movement of said rotary output member and (2) manual rotational movement in either direction without a commensurate movement of said rotary output member,

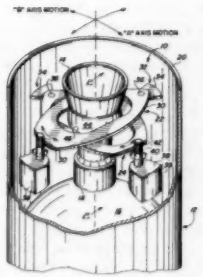
part circle pattern control means operatively connected with said reversible flow directing means and said sprinkler head structure including first means for adjustably predetermining the limits of the part of the circular ground pattern within which the instantaneous generally segmental ground pattern of the water is moved in opposite directions by corresponding opposite movements of the sprinkler head structure through positions within such limits and second means operable when said sprinkler head structure is manually moved as permitted by said slip clutch means into a position beyond the predetermined limits for enabling the sprinkler head structure to be moved in response to the rotational movement of said impeller back within said limits for continued normal movements in opposite directions within said limits.

4,892,253

YOKE NOZZLE ACTUATION SYSTEM

John M. Speicher, and Allan A. Voigt, both of Geyserville, Calif., assignors to Versatron Corporation, Healdsburg, Calif.

Filed Aug. 15, 1988, Ser. No. 232,022
Int. Cl.[4] F02K *9/84*
U.S. Cl. 239—265.35 **23 Claims**



1. A nozzle actuator for controlling the thrust angle of a rocket nozzle used to propel a vehicle comprising:

a vehicle frame support member;

a steerable nozzle mounted to propel the vehicle;

a yoke plate having a bearing surface for contacting the nozzle along one side to transmit force thereto;

means for pivotably mounting the yoke plate to said support member; and

means for pivoting the yoke plate about said mounting means so as to direct force through the bearing surface to change the thrust angle of the nozzle.

4,892,254

AIRCRAFT ENGINE INTERFACE FAIRING SUPPORT

Raymond P. Schneider, Lake Park; Ronald C. DuPont, Stuart, both of Fla., and Michael J. Dickman, Hanover, N.H., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 9, 1988, Ser. No. 165,954
Int. Cl.[4] B64C *15/06*
U.S. Cl. 239—265.41 **4 Claims**

1. In a gas turbine engine within an aircraft engine compartment an apparatus comprising:

an augmentor duct conveying hot exhaust gas;

a plurality of convergent nozzle flaps forming an adjustable convergent nozzle receiving gas from said augmentor duct;

a plurality of external flaps surrounding said convergent nozzles in spaced relationship forming a flap chamber therebetween;

a sync ring pivotally connected to said convergent nozzle and said external nozzle for adjusting the position of said nozzles;

a static support structure circumferentially surrounding said augmentor duct, the upstream end of said support structure supported from said augmentor duct, a cylindrical stiffner at the upstream end of said support structure;

an actuator supported at least in part from said stiffner and connected to said sync ring for providing an axial travel of said sync ring;,

a cylindrical impervious lightweight fairing surrounding said support structure from said stiffner location to the location of the connection of said sync ring to said nozzle flaps;

a plurality of finger seals located on said stiffner and sealingly biased against said fairing, whereby fumes from said engine compartment may not enter the space inside said fairing; and

said fairing supported from said support structure at a support location on said support structure;

said support location being upstream of the travel of said sync ring and downstream of said stiffner.

4,892,255

CENTRIFUGAL APPLICATING DEVICE

John E. Waldrum, 349 Fairview Ave., Ambler, Pa. 19002

Filed Oct. 14, 1988, Ser. No. 258,186
Int. Cl.[4] A01C *19/00*; B64D *1/18*
U.S. Cl. 239—682 **15 Claims**

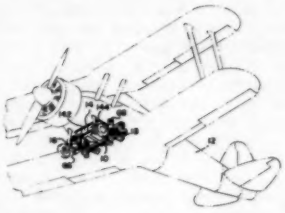
1. An applicating device for spreading granular materials from a storage hopper mounted in an aircraft comprising

an upper plate secured to the aircraft below the storage hopper, the upper plate being provided with a pair of spaced material inlet openings to receive the granular materials from the storage hopper therethrough,

a pair of star wheel applicators rotatively secured to the upper plate, each star wheel applicator being positioned respectively below a material inlet opening, the star wheel applicators receiving portions of the granular materials from the storage hopper through the material inlet openings,

the star wheel applicators each comprising a central opening and a plurality circumferentially spaced hollow nozzles leading outwardly from the central opening,

a plurality of planar, enlarged paddles, each paddle being respectively affixed to a side of a nozzle to receive wind forces generated by forward movement of the aircraft to cause rotation movement of the star wheel applicators, each paddle being integral with and directly connected to its associated nozzle;



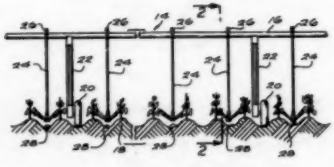
whereby the granular materials will be spread in a circular pattern by centrifugal force through the nozzles of each star wheel applicator.

4,892,256

UP-SPRAY DEFLECTOR CUP FOR SPRAYING THE UNDERSIDE OF PLANT FOLIAGE

Richard D. Brown, Glendora; Doyle R. Metz, Ontario, and Roger W. Perkins, Glendora, all of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Sep. 1, 1988, Ser. No. 239,796
Int. Cl.[4] B05B *1/26*; A01G *25/09*
U.S. Cl. 239—734 **8 Claims**



5. An up-spray deflector cup for deflecting water from a downwardly directed nozzle upwardly and radially outwardly as a pair of oppositely directed fan shaped sprays, said deflector comprising:

a circular bottom having a generally horizontal upper face;

a peripheral side wall integrally formed with said bottom and projecting upwardly and radially outwardly therefrom; and

first and second diametrically opposed pairs of vertical walls projecting radially inwardly from said side wall and terminating inwardly and vertical apices lying in a vertical plane diametrically through said bottom, the arcuately facing walls of each pair of vertical sides cooperating with the adjacent side wall portion extending therebetween to define deflecting surfaces for forming symmetrical fan shaped spray patterns on each side of said plane.

4,892,257

CONE CRUSHER COMPRISING ECCENTRICALLY DRIVEN CRUSHING CONE AND A MEANS FOR PREVENTING THE ENTRAINMENT OF THE CRUSHING CONE DURING NO-LOAD OPERATION

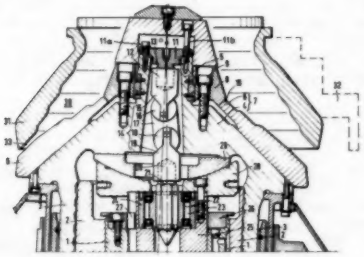
Helmut Stoeckmann, Wesseling; Klaus Schuette, and Franz-Rudolf Schmitz, both of Cologne, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 284,919

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742460

Int. Cl.[4] B02C *2/04*

U.S. Cl. 241—32 10 Claims



1. A cone crusher comprising in combination:

an eccentrically driven crushing cone;

a stationary main shaft;

and a means for preventing the entrainment of the crushing cone given no-load operation in the form of a one way clutch that is functionally connected between the crushing cone and the stationary main shaft of the crusher via a torsionally stiff articulated shaft arranged between the crushing cone and the one way clutch and having multiple individual parts including an upper connecting part and a lower connecting part and a common middle part and a first universal joint between the upper and middle and a second universal joint between the middle and lower part.

4,892,258

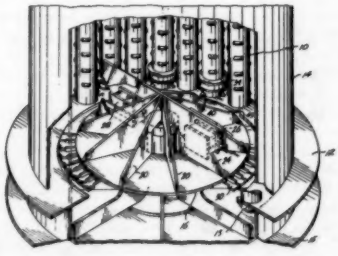
COMMINUTER FOR SOLID MATERIAL

John H. Hughes, 439 Monte Elma Rd., Montesano, Wash. 98563

Continuation of Ser. No. 861,424, May 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 635,213, Jul. 27, 1984, abandoned. This application Apr. 11, 1988, Ser. No. 183,270

Int. Cl.[4] B02C *23/10*

U.S. Cl. 241—79.3 15 Claims



1. In an apparatus for comminuting solid materials to form particles, including a housing defining a comminuting chamber, said comminuting chamber formed by a series of comminuting rolls arranged within said housing, said housing further defining an adjacent discharge chamber, screening means located at an interface between said comminuting chamber and said discharge chamber, said screening means including a disk horizontally mounted within said housing for free rotation in a horizontal plane, said disk having a peripheral edge spaced from said comminuting rolls to define therebetween a size restriction passage for particles moving from said comminuting chamber to said discharge chamber, a series of screening members mounted on said disk independently of one another, a first portion of each of said screening members extending past said peripheral edge of said disk into said size restriction passage, and means for positioning each screening member relative to each other screening member past said peripheral edge of said disk so as to allow independent selective variation of the size of said first portion of each said screening members extending past said peripheral edge of said disk.

4,892,259

APPARATUS FOR RECEIVING, TRANSPORTING, CHOPPING, AND DISPENSING BLOCKS OF FODDER

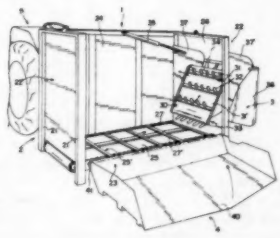
Hans von der Heide, Ibbenbürener Str. 17, 4530 Ibbenbüren 2 - Laggenbeck, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 278,974

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740761; Mar. 9, 1988, 3807738

Int. Cl.[4] B02C *21/02*

U.S. Cl. 241—101.7 7 Claims



1. Apparatus for picking up, transporting, comminuting and dispensing fodder blocks, especially silage, brewers' grains and/or corn cob mix, comprising:

a body having an open end;

loading means for loading a fodder block into said body;

conveyor means disposed on a floor of said body and running transversely of a longitudinal axis of the apparatus; and

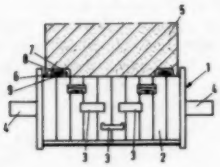
means for the comminution and lateral discharge of the fodder block, said loading means comprising a platform which can be turned about a horizontal shaft close to said floor of said body and adjacent said open end from a flat, approximately horizontal position for driving under a block and picking it up and dumping it into said body, to a substantially vertical position closing said end of said body, as well as in the reverse direction, and said means for the comminution and discharge comprising at least one cutter chain system disposed laterally on said body and sloping upwardly and outwardly.

4,892,260

KNIFE ROLLER FOR AN APPLIANCE FOR THE PRECOMMINUTION OF FROZEN MATERIAL

Juergen Hager, Huecksewagen, and Walter Vieth, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Magurit Gefrierschneider GmbH, Remscheid-Lennep, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 301,536
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 8800928[U]
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—282.2 23 Claims



1. A knife roller used in an appliance for the precomminution of a frozen block of material, comprising:

an annular roller member having an outer surface which is rotatable about an axis;

at least one cutting member fastened to said roller member;

said cutting member having a U-shaped bow knife for cutting strips of material from said frozen block, said bow knife formed by a shearing knife spaced a radial distance from the surface of said roller member and two radially extending precutters, each of said precutters attached at their radially outermost end to respective ends of said shearing knife, and at their radially innermost end to said roller member, said shearing knife and said precutters defining a chip passageway;

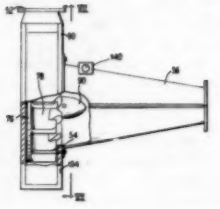
said cutting member further having at least one substantially radially extending transverse knife secured between said precutters within said chip passageway for cutting said strips of material removed by said bow knife into smaller chips of material.

4,892,261

MATERIAL COMMUNITOR

Thomas E. Rolle; David J. Nebel; John L. Shulan, and William P. Liljestrom, all of Dubuque, Iowa, assignors to The T.D.J. Co., Inc., Dubuque, Iowa

Continuation of Ser. No. 112,408, Dec. 7, 1987, which is a continuation of Ser. No. 841,795, Mar. 20, 1986, Pat. No. 4,718,609. This application Apr. 21, 1989, Ser. No. 341,793
Int. Cl.[4] B02C *19/18*
U.S. Cl. 241—301 2 Claims



1. A device for the comminution of solid material comprising:

(a) a turbine comprising a plurality of blades mounted on a shaft for rotation about an axis, said shaft mounted in cantilevered manner in a set of bearings;

(b) a motor;

(c) a drive connection between said motor and said turbine for rotatably driving said turbine;

(d) a housing enclosing said turbine having an axial inlet and a tangential outlet for the passage of an air stream caused by said rotating turbine;

(e) means for varying the comminution effect of said device upon said material comprising an expansion chamber connected at one end to the axial inlet of said housing and connected at another end to a varied size velocity chamber; and

(f) feed tube means for feeding material to be comminuted into said air stream upstream of said velocity chamber;

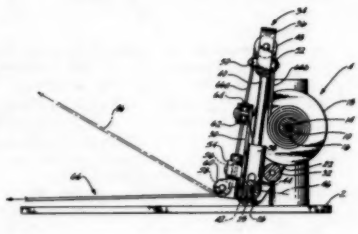
whereby, material carried in said air stream is subjected to a rapid decrease in pressure in said expansion chamber as said material is drawn through said expansion chamber, said decrease in pressure being adjustable by interchanging various sized velocity chambers to vary the size of resultant comminuted material, and said material is comminuted and is exhausted with said air stream through said housing outlet.

4,892,262

LEVEL WINDER FOR WINCH

George H. Hurst, Redlands, Calif., assignor to George Hurst Level Winders, Inc., Los Angeles, Calif.

Continuation of Ser. No. 9,098, Jan. 21, 1987, abandoned, which is a continuation of Ser. No. 780,614, Sep. 26, 1985, abandoned. This application May 3, 1988, Ser. No. 191,793
Int. Cl.[4] B65H *57/28*
U.S. Cl. 242—157.1 5 Claims



1. A level winder in combination with a winch having a drum on which a cable is wound from a fleet point in a contiguous helical configuration, the drum having an axis of rotation and edges, the level winder comprising:

a cable control arm mounted on support means at one end and pivotable about a first axis lying in a plane extending perpendicular to the plane including the drum axis of rotation and a second axis intersecting the first axis and extending parallel to the drum axis of rotation, the arm having oppositely disposed cable approach and drum approach sides, the cable approach side facing towards the fleet point and the drum approach side facing towards the drum;

a support member attached to said support means on the cable approach side of the control arm;

a first pulley mounted on the support member and rotatable about an axis extending transversely of the cable approach direction to the control arm;

a second rotatable pulley rotatably mounted on the distal end area of said control arm for rotation about an axis extending parallel to the plane including the drum axis, said second pulley arranged to guide the cable and reverse its direction between the cable and drum approach sides of the control arm;

a first pair of opposed guide rollers mounted on the support member between the first and second pulleys, said first pair of guide rollers arranged to guide the cable between

the first and second pulleys and to rotate about parallel axes extending perpendicular to the first pulley axis;

the distance between the first pair of guide rollers and said second pulley defining a first cable length and the distance between the second pulley and the drum defining a second cable length when a cable is fitted between the first pulley, the second pulley and the drum;

the geometric relationship between the drum axis, the control arm, first and second axes, and the first and second cable lengths being such that, when said control arm pivots about either or both its first and second axes, the total sum of said cable lengths remains constant while each of said lengths varies inversely relative to the other, whereby a cable approaching the control arm, extending over the pulleys and wrapping around the drum from the drum approach side of the control arm is wound in contiguous helical turns by the force of the approaching cable turns reacting against the control arm and causing its pivotal motion about is first axis, and whereby the reaction force of the cable approaching the drum and progressively encountering a larger diameter surface as the cable is wound on the drum causes the control arm to pivot about its second axis.

4,892,263

UNWINDING APPARATUS FOR A PAPER OR BOARD WEB

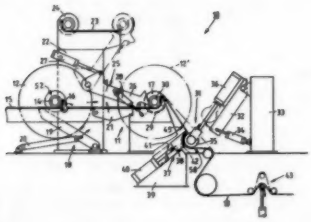
Rudolf Beisswanger, Steinheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,522

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723600

Int. Cl.[4] B65H *19/14*

U.S. Cl. 242—58.3 **10 Claims**



1. An apparatus for unwinding a paper web wound as a parent roll on a roll axle for subsequent handling by a succeeding rewind station, said apparatus comprising:

an unwinding unit including guideway means for receiving the ends of the roll axle of the parent roll, the parent roll being movable between a waiting position and an unwinding position on said guideway means;

splicing means for splicing the web-end of an unwound web to the web-beginning of a parent roll located in the unwinding position, said splicing means including a cross member substantially parallel to the roll axle of the parent roll, the cross member being movable against the unwound web substantially perpendicularly to the direction of web travel from a position in which the cross member is out of contact with the web to a position in which the cross member is partially wrapped by the web-end of the unwound web, the cross member wrapped by the web-end being movable against the parent roll, the parent roll being provided at the periphery thereof with adhesive on the web-beginning, the parent roll during splicing being fixed in the unwinding position with the adhesive in the path of motion of the web-end wrapped on the cross member;

separating means for separating the web expiring from the parent roll substantially perpendicularly to the direction of web travel, said separating means being movable between a working position in which the web, when stationary, is clamped to the cross member of said splicing means by said separating means and a neutral position out of contact with the web to which said separating means is returned after separation of the web;

lifting means for lifting out of the unwinding position the roll axle of an expired parent roll whose expiring web has been separated by said separating means; and

a dancer roller arranged after said splicing means in the direction of web travel, said dancer roller dipping into the unwound web expiring from the parent roll and emerging therefrom during splicing of the web.

4,892,264

LOWERING MECHANISM FOR THE FOIL IN A DEVICE FOR WINDING-UP A FOIL WEB, PARTICULARLY A SYNTHETIC-MATERIAL FOIL WEB

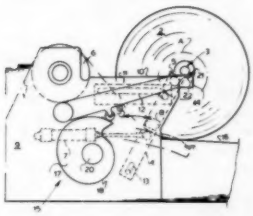
Norbert Achterwinter, Hilden, and Wolfgang Hax, St. Augustin, both of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,017

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3721966

Int. Cl.[4] B65H *19/26*

U.S. Cl. 242—58.6 **5 Claims**



1. A lowering mechanism for a foil roll in a device for winding up a foil web comprising:

a frame;

a contact roller mounted on said frame for guiding said foil web;

a roll core receiving said foil web guided from said contact roller, said foil web being wound around said roll core to form said foil roll;

a pair of loweing arms each for receiving an end of said roll core, said lowering arms each attached to one side of said frame;

a pair of lowering arm plates mounted each on a side of said frame having an outer leading edge basically in the shape of a numeral 6;

a guide means attached to each of said lowering arms to guide said arms through contact with said cam plates;

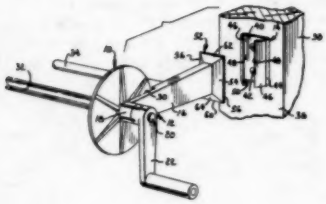
a drive shaft connecting said pair of lowering cam plates; and

a drive means for rotating said drive shaft whereby as said cam plates are rotated by said drive means said lowering arms are moved between vertical positions for removing said foil roll.

4,892,265
WRAP WINDER WITH REVERSIBLE MOUNTING BRACKET

Lloyd D. Cox, Rte. 2, Box 81A, Pratt, Kans. 67124

Filed Aug. 26, 1988, Ser. No. 237,055
Int. Cl.[4] B65H *17/46*; A47B *96/06*
U.S. Cl. 242—67.1 R 1 Claim



1. Apparatus for rolling elongated, flexible leg wraps to facilitate the application of wraps to horses, said apparatus comprising:

an elongated, rigid frame rotatably mounting a winding spindle projecting from one side of the frame and a handle for turning the spindle projecting from the opposite side of the frame;

a mounting bracket adapted to be secured to a support for mounting the frame in outwardly projecting relationship from said member, said bracket comprising a substantially rigid element having a back section with a substantially flat major surface and a back surface, said element being adapted to be secured to said member, said bracket having a pair of forwardly extending planar side sections integral with the back section and projecting forwardly therefrom, said side sections being inclined inwardly toward one another and terminating in parallel, vertically extending edges with the edge of each side section spaced from the edge of the other side section whereby said side sections and the back section conjointly define a generally T-shaped, vertically extending slot open at the top and front of the bracket, the latter including a restriction adjacent the bottom of the slot, the sides of said slot being defined by said inclined planar side sections of the bracket and the back of the slot being defined by said flat major surface; and

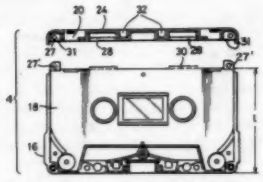
an elongated, rigid component rigidly carried by the frame at one end of the latter for complemental insertion of the component longitudinally in the slot from the open upper end thereof for releasably securing the component and frame together to mount the frame to the member when the component is in said slot, said component having a flat face engageable with the bracket major surface and a pair of forwardly and inwardly beveled side shoulders engageable with the slot defining edges of said bracket side sections when the component is in said slot, the component being longitudinally symmetrical to permit insertion of the component into the slot from either end of the component so that the frame may be mounted on the member in disposition with the handle and spindle projecting in either of two selected directions from the frame,

said bracket restriction comprising a flange on each bracket side section respectively, each respective flange projecting inwardly toward said bracket flat major surface and terminating in an edge at the bottom of said slot extending in spaced apart relationship from said flat major surface, and wherein said component has forwardly and inwardly beveled end shoulders on the respective ends of the component, a corresponding one of said end shoulders being adapted to engage the edges of said flanges when the component is installed in said slot.

4,892,266
MAGNETIC TAPE CASSETTE

Kimio Tanaka; Takateru Sato, both of Saku, and Haruo Shiba, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 264,227
Int. Cl.[4] G11B *23/04*
U.S. Cl. 242—199 6 Claims



1. A magnetic tape cassette having a front and rear portion comprising:

(a) upper and lower half members defining a housing having a front end and a rear end, wherein the front end of said housing is also the front portion of said tape cassette,

(b) a pair of rotary hubs having a magnetic tape wound therearound, wherein said hubs are rotatably housed in said housing,

(c) guide rollers and tape guides provided on said upper and lower half members for guiding said magnetic tape from one of said hubs to the other of said hubs by way of the front end of said housing,

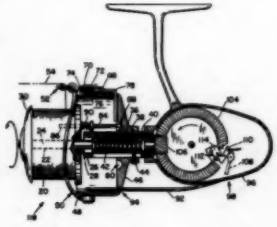
(d) a rear member having a front end and a rear end, wherein the rear end of said rear member is also the rear portion of said tape cassette, and wherein the rear end of said rear member comprises a means for preventing erasure by mistake and a means for detecting the kind of magnetic tape wound around said hubs, and

(e) coupling means for coupling the front end of said rear member to the rear end of said housing.

4,892,267
COMBINATION FISHING REEL

Charles A. Webb, 21 Amherst St., Nashua, N.H. 03060

Continuation-in-part of Ser. No. 99,497, Sep. 27, 1987, abandoned. This application Jan. 28, 1988, Ser. No. 149,493
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—228 16 Claims



1. Fishing reel comprising:

a support member;

a spool rotatably mounted on the support member, said spool positioned on the support member to allow line wound upon the spool to be discharged in a direction approximately parallel to the axis of the spool;

recovery means for rotating the spool about its axis for retrieving line, the recovery means comprising:

a worm gear coaxially coupled to the spool, the worm gear having a continuous groove which traverses the gear; and

a gearing mechanism for rotating the worm gear about its axis;

a guide mechanism for distributing line onto the spool when the recovery means rotates the spool;

a follower secured to the guide mechanism and fitted within the groove of the worm gear for tracing the path of the groove when the worm gear is rotated thereby causing the guide mechanism to traverse the axis of the spool; and

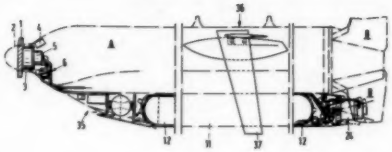
means for pivoting the guide mechanism from a loaded line disengaged position to a line engaged retrieval position when the spool is rotated.

4,892,268

PROPULSION, MONITORING AND CONTROL UNIT PARTICULARLY FOR BALLISTIC OBJECTS

Claudio Peretti, and Guglielmo Rebuffatti, both of Lombardore Turin, Italy, assignors to A.R.I.S.S.p.A., Lombardore Turin, Italy

Filed Aug. 5, 1988, Ser. No. 228,973
Int. Cl.[4] F42B *15/033*
U.S. Cl. 244—3.1 **6 Claims**



1. A command, control and propulsion unit applicable to ballistic objects, to give them the capability of autonomous flight for a pre-established period, following launching from a carrier aircraft, the munitions having a body, and the unit comprising:

substantially bivalve air carrying equipment consisting of a winged saddle mounted to straddle the body of the munition, and a cradle mounted in radial opposite position to the saddle and with respect to the body which is locked between the saddle and the cradle;

removable means for mutual coupling of the saddle, cradle, and the body;

an alternator;

a pump;

a wind-drive propeller for operating said alternator and said pump;

a warhead integral with said wind-drive propeller;

an electric plant contained in the cradle fed by electric power generated by the alternator;

a first tank disposed in the cradle having a pressurizable vacuum space for carrying liquid oxygen;

second tanks for carrying liquid fuel;

a rocket motor for controlling flight of the munition; and

a plurality of devices for control and command of the motor.

4,892,269

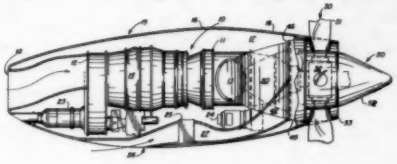
SPINNER DUCTED EXHAUST FOR PUSHER TURBOPROP ENGINES

Robert J. Greco, Tempe, and Jack D. Betterton, Mesa, both of Ariz., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Apr. 28, 1988, Ser. No. 187,619
Int. Cl.[4] B64D *33/00, 29/00*
U.S. Cl. 244—53 R **18 Claims**

8. A method of cooling the interior of a nacelle surrounding an aircraft turboprop engine, of the type having a rotatable propeller and spinner assembly mounted to a gearbox immediately downstream of the turbine engine, comprising the steps of:

providing structure defining an annular ducted fan circumscribing a portion of said spinner assembly, said portion including the propeller blades, and configuring said ducted fan to contain a plurality of hollow, aerodynamic fan blade members surrounding the root of each propeller blade;



aligning said ducted fan with the open aft end of said nacelle; and

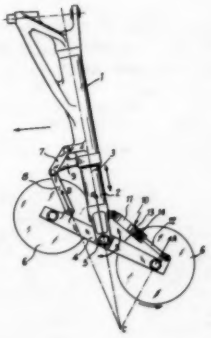
rotating said ducted fan structure in unison with said propeller to assist the flow of cooling air through said engine nacelle.

4,892,270

ROCKING BEAM LANDING GEAR

Michel Derrien, Versailles; Jacques Veaux, Chatillon, and Jean-Pierre Hainaut, La Queue en Brie, all of France, assignors to Messier-Haspano-Bugatti, Montrouge, France

Filed Jun. 8, 1988, Ser. No. 203,994
Claims priority, application France, Jun. 9, 1987, 87 07996
Int. Cl.[4] B64C *25/36*
U.S. Cl. 244—104 R **7 Claims**



1. Landing gear comprising a pivoting strut receiving the rod of a shock absorber which projects downwardly from the strut and is movable in an axial direction relative thereto, a rocking beam mounted to tilt at the bottom end of the shock absorber rod and supporting leading and trailing wheel sets, a torque linkage comprising a top branch and a bottom branch which are hinged to each other, the top branch being hinged to the strut and the bottom branch being hinged to the rocking beam, and locking means for limiting a downwards pivot movement of the top branch of the torque linkage while the shock absorber rod is in both a fully extended and nonfully extended position.

4,892,271

CORONA DISCHARGE SURFACE TREATMENT AND AIRCRAFT COCKPIT CANOPIES SO TREATED

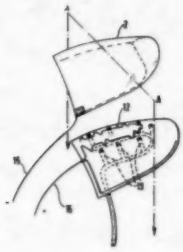
Andrew M. Elford, Eastleigh, United Kingdom, assignor to British Aerospace PLC, London, United Kingdom

Filed Oct. 11, 1988, Ser. No. 255,398

Claims priority, application United Kingdom, Oct. 14, 1987, 8724078

Int. Cl.[4] B64C 1/14

U.S. Cl. 244—121 7 Claims



1. Apparatus for electrically pre-treating selected areas of a shaped article by corona discharge, comprising an electrically nonconductive jig shaped to conform with the internal shape of, and to mount, the article, electrode means mounted on said jig and connectable to a source of high voltage, the improvement consisting in that at least one rebate is formed in an external surface of said jig of a shape, size and position corresponding to said selected areas said electrode means being located in said at least one rebate at a predetermined depth and in that said electrode means and said article are in use connected to terminals of opposite polarity of said source whereby on application of a potential difference between the article and the electrode means a corona discharge occurs at said selected areas only.

4,892,272

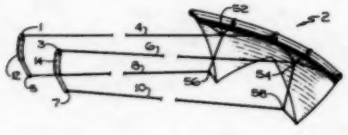
KITE-LIKE FLYING DEVICE WITH DUAL HANDLES AND FOUR POINT CONTROL

Joseph R. Hadzicki, 4489 Caminito Cuarzo, San Diego, Calif. 92117

Filed Oct. 14, 1988, Ser. No. 257,859

Int. Cl.[4] B64C 31/06

U.S. Cl. 244—153 R 9 Claims



1. A kite, comprising:

a substantially double V shaped sail having a left wing and a right wing each connected to a supporting frame, said frame having a leading edge support member associated with a left wing strut member and with a right wing strut member;

bridle means associated with said frame, said bridle means having a horizontal line member connected to said leading edge support member, a left wing vertical line member connected to said left wing strut member, and a right wing vertical line member connected to said right wing strut member; and

a set of control lines connected to said bridle, said set of control lines including an upper left line and a lower left line connected to upper left and lower left control line contact points, for controlling inclination of said left wing, respectively, and an upper right line and lower right line connected to upper right and lower right control line contact points, respectively, for separately controlling inclination of said right wing.

4,892,273

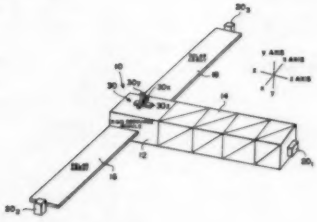
ACTIVE DAMPING OF SPACECRAFT STRUCTURAL APPENDAGE VIBRATIONS

Joseph V. Fedor, West Hyattsville, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,143

Int. Cl.[4] B64G 1/28

U.S. Cl. 244—158 R 10 Claims



1. Apparatus located on a space platform for actively damping structural appendage vibrations along three mutually perpendicular axes of a generally flexible body member attached to a generally rigid body member wherein the apparatus for each axis comprises:

means for sensing the inertial acceleration substantially at the end of said flexible body member and generating a first acceleration signal indicative thereof;

means for sensing the inertial acceleration of said rigid body member and generating a second acceleration signal indicative thereof;

means for determining the difference between said first and second acceleration signals and integrating the difference therebetween to generate a signal proportional to the relative motional velocity at the end of said flexible body member;

electrical circuit means responsive to said signal proportional to relative velocity for generating a motor drive signal;

an electric motor responsive to said motor drive signal for operating an inertia wheel; and

an inertia wheel connected to said motor for developing a torque for damping a predetermined vibrational mode along one of said axes.

4,892,274

SEGMENTIZED FLAP SYSTEM

Ulrich Pohl, Bremen, and Juergen Renken, Freyersen, both of Fed. Rep. of Germany, assignors to MBB GMBH, Bremen, Fed. Rep. of Germany

Filed Aug. 26, 1986, Ser. No. 900,508

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530865

Int. Cl.[4] B64C 9/06, 9/16

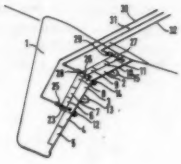
U.S. Cl. 244—213 5 Claims

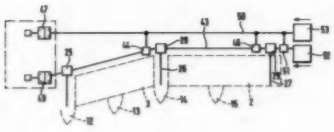
1. A flap system for transonic aircraft wings which system includes flap segments arranged in span direction, a driving system for protraction and retraction of the flap segments, comprising:

a plurality of spindle drives connected to said flap segments

such that each flap segment is connected to at least two spindle drives; and

control means for controlling said spindle drives in such a manner that at least some of the drives are independently





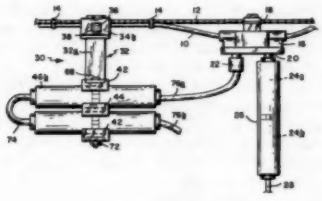
controlled from each other, such that those of the spindle drives that are connected to the same flap segment, are controlled independently from each other to obtain pivoting of that same flap segment on a vertical axis.

4,892,275

TRAP BRACKET ASSEMBLY

Andrew Szegda, Canastota, N.Y., assignor to John Mezzalingua Assoc. Inc., Manlius, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,028
Int. Cl.[4] E21F *17/02*
U.S. Cl. 248—61 **8 Claims**



1. For use in a cable television system having a coaxial cable extending coextensively with and supported by a support cable, with the coaxial cable being adapted to carry a plurality of television signals which are scrambled by scrambling signals injected therein, the continuity of the coaxial cable being interrupted by at least one tap from which the scrambled television signals may be directed via a drop line to subscriber's receiver, with filter traps contained in protective shields and connected in series in the drop line between the tap and the subscriber's receiver to filter out the scrambling signals, the improvement comprising: a trap bracket assembly for supporting said shields and the traps contained therein at a location proximate to said trap, said bracket assembly including:

(a) a hanger bracket having a vertical segment, a lower segment extending horizontally from said vertical segment to define an L-shaped configuration, and an upper segment extending horizontally from said vertical segment to overlie said lower segment;

(b) first connector means associated with said upper segment for detachably securing said hanger bracket to the support cable;

(c) a plurality of vertically stacked clamp blocks underlying said lower segment, said clamp blocks having complimentary confronting sides configured to grip said shields therebetween and to maintain said shields in a mutually spaced parallel arrangement; and

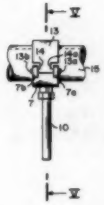
(d) second connector means for separably interconnecting said clamp blocks to each other and to said lower segment.

4,892,276

COLLAR FOR FASTENING PIPES, CABLES, RODS AND THE LIKE

Walter Alessio, 24 Via E.Fermi, Paderno Dugnano MI, Italy

Filed Oct. 17, 1988, Ser. No. 258,792
Int. Cl.[4] F16L *3/10*
U.S. Cl. 248—74.1 **1 Claim**



1. A pipe-fastening collar of the type having a first upper and a second lower arcuate half-clamps arranged opposite each other, the lower half-clamp being centrally integral with a stud anchored onto a support surface, wherein:

said first upper half-clamp is provided at a first end with a flat flange having a bore for a bolt therein and at a second end opposite said first end with hooking means consisting of two end pins, axially opposite each other, defined by two slots provided on both sides of said half-clamp end; and

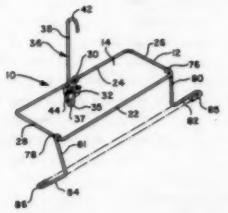
said second lower half-clamp is provided at a first end with a flat flange having a bore corresponding to the bore of said first upper half-clamp and at a second end opposite said first end with open hinge hooking means consisting of two flanges arcuate upwards and towards the outside of the half-clamp, so as to rotatably house said end pins of said first upper half-clamp.

4,892,277

WIRE SUPPORT RACK FOR DISPOSABLE PLASTIC TRASH BAGS

Mark A. Tobis, 1195 Sanders Rd., Northbrook, Ill. 60062

Filed Oct. 24, 1988, Ser. No. 261,105
Int. Cl.[4] B65B *67/12*
U.S. Cl. 248—101 **1 Claim**



1. A mounting for a conventional plastic bag having a body portion and an upper foldable portion from a mower handle having a hand held cross-bar and a pair of side members extending downwardly and forwardly to the mower comprising;,

a peripheral frame comprising an endless quadrilateral wire a hoop adapted to receive the body of the bag therethrough with an upper portion folded thereover;

a hanger with a U-shaped lower portion comprising laterally spaced inner and outer vertical legs;

means securing the upper end of the inner leg to the hoop;

a hook at the upper end of the other leg adapted to hook over the cross-bar; and

a releasable securement mounted between said legs for holding the folded portion of the bag entered therein and a pair of tensioning hoots extending laterally from said side members for hooking thereabout.

4,892,278

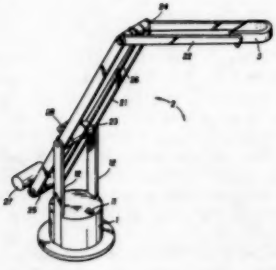
REVOLVING SHAFT CONTROLLED MOVABLE LAMP STAND

Soddy Huang, 2F, No. 31, Lane 57, Tung Shun St., Shulin, Taipei Hsien, Taiwan

Filed Feb. 7, 1989, Ser. No. 307,878

Int. Cl.[4] F21V *21/14*

U.S. Cl. 248—124 3 Claims



1. A revolving shaft controlled movable lamp stand including a stand, a driving mechanism, and an illuminator lamp socket comprising: said driving mechanism comprises an actuating rod having a bottom and an upper end and driven rod, both said actuating rod and said driven rod being pivotally connected by means of an upper revolving shaft; said stand comprising two supporting arms bilaterally disposed to pivotally connect with said actuating rod by means of a located rod; a lower revolving shaft being pivotally connected with said actuating rod at the bottom end thereof; a holder and a handle being made on said lower revolving shaft and said locating rod respectively; said lower revolving shaft and said upper revolving shaft each comprising a circular groove and a hole, each said hole comprising an end a and an end b; a rope being provided to wind round said upper and lower revolving shafts through said holes and circular grooves of said upper and lower revolving shafts, to further let one end of said rope, which comprises a screw rod, be screwed up with the other end of said rope, which comprises a fastening matching means, so as to form a closed circulation; by means of said arrangement, said actuating rod being adjusted to change position by means of the operation through said hole and said handle so as to change the projecting position of the attached illuminator; said driven rod being adjusted by means of the up-and-down displacement of said holder, to drive said lower revolving shaft to provide an angular displacement so as to further let said rope drive said upper revolving shaft to make a synchronous movement and to further let said upper revolving shaft drive said driven rod to displace up-and-down and to change the position of the attached illuminator.

4,892,279

FULLY PORTABLE MEDICAL I.V. EQUIPMENT STAND/POLE

William G. Lafferty, and Robert E. Howard, both of Deephaven, Minn., assignors to Polymedical Technologies, Inc., Deephaven, Minn.

Filed May 4, 1987, Ser. No. 45,329

The portion of the term of this patent subsequent to Nov. 9, 2005, has been disclaimed.

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—125 4 Claims

1. A collapsible and fully portable medical I.V. equipment stand/pole of a character described above which comprises:

a. a many sectioned mast assembly made from hollow tubes, with each being of a slightly larger diameter and the smallest being the uppermost tube and the largest being the lowermost, and each being able to slide smoothly within one another in a telescoping fashion;

b. an internal pneumatic safety device built within the lower section of said tube mast assembly which acts to compress air as the upper sections of said mast assembly are lowered accidentally or on purpose thereby limiting the downward force and speed of said upper sections, but allowing movement of upper sections in both directions;

c. a slidable control handle assembly which is mounted on the lower section of said mast assembly to which the lower leg supports a plurality of legs which support said mast assembly are connected via vertical rods and which allow for opening or closing of square tubular leg supports in one continuous motion;

d. a hanger rod assembly which is permanently attached to the top of the uppermost said tubular section of said mast allowing independent inward and outward movement of each hanger rod and which rotates freely in either direction 360 degrees around the circumference of said uppermost tubular section and both movements of said hanger rod asembly which are free or able to be locked into position with the loosening or tightening of a vertically positioned control knob.

4,892,280

CLAMPING DEVICES FOR USE WITH ELONGATE MEMBERS

John D. McGugan; William A. Turner, and Robert A. M. Hunt, all of Aberdeen, Scotland, assignors to Hunting Oilfield Services Limited, Aberdeen, Scotland

Filed Sep. 29, 1988, Ser. No. 250,714

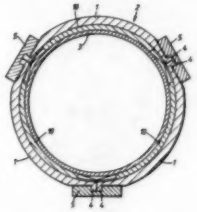
Claims priority, application United Kingdom, Oct. 5, 1987, 8723352

Int. Cl.[4] A47B *96/00*

U.S. Cl. 248—230 19 Claims

1. A clamping device for clamping onto an elongate member comprising an annular shell for surrounding the elongate mem-

ber and formed by a plurality of generally part annular segments, each segment having generally axially extending edges, each edge being provided with an outwardly projecting rib extending axially therealong, the ribs of adjacent segments being in use juxtaposed, engagement members for engaging each pair of juxtaposed ribs for holding the segments together around the elongate member, the engagement members being slidable longitudinally of the ribs into full engagement with the respective pairs of juxtaposed ribs, wherein part at least of the inner surface of the shell is frustoconical and wedge means are



provided for positioning between the shell and the elongate member to stress said part of the shell to clamp the shell around the elongate member, the wedge means comprising a plurality of axially extending, circumferentially spaced wedge members, each having an inner surface shaped to engage the surface of the elongate member and a part frustoconical outer surface corresponding to the frustoconical inner surface of said shell, said wedge members being axially movable relative to the shell for adjusting the force applied by the shell to the elongate member.

4,892,281

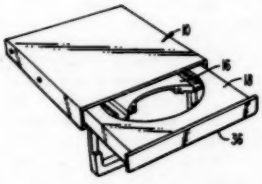
GENERIC BEVERAGE CONTAINER HOLDER

Michael DiFilippo, Royal Oak, and David N. Grabowski, Rochester Hills, both of Mich., assignors to Chivas Products Limited, Sterling Heights, Mich.

Continuation-in-part of Ser. No. 4,994, Jan. 20, 1987, Pat. No. 4,738,423. This application Dec. 29, 1987, Ser. No. 138,988

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—311.2 **17 Claims**



1. A generic container holder, usable with containers over a range of lateral sizes, for mounting to a surface comprising:

a housing mountable to said surface;

a frame mounted to said housing for movement between a retracted position, wherein said frame is within said housing, and an operational position, wherein said frame extends from said housing, said frame having a portion defining a central open area for receiving said containers;

said frame including first and second telescoping members for moving between an extended condition and a collapsed condition as said frame moves between said retracted and operational positions, each of said first and second telescoping members having a peripheral edge;

said central opening being formed by the peripheral edges of said first and second telescoping members.

4,892,282

SEAT SLIDING APPARATUS FOR VEHICLES

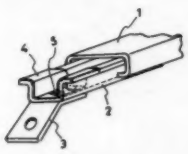
Saburo Suzuki, Tokoname; Takami Terada, Toyota, and Masayuki Yamazaki, Himi, all of Japan, assignors to Aisin Seiki,Co. Ltd., Japan

Filed Sep. 28, 1988, Ser. No. 250,465

Claims priority, application Japan, Sep. 29, 1987, 62-148999[U]

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—430 **4 Claims**



1. A slide assembly for a seat, comprising:

a longitudinally extending elongated lower rail having a generally U-shaped cross sectional configuration with a central base portion and spaced legs each with an outwardly extending flange portion adjacent an outer end, each flange portion having an edge surface;

a bracket affixed to the lower rail for fastening the rail to a surface with the legs extending in a substantially upward direction;

an upper rail, for attachment to the seat, slidably mounted to the lower rail for longitudinal movement relative the lower rail;

a reinforcing member having a length substantially shorter than the lower rail and having a generally U-shaped cross-sectional configuration with outwardly extending flange portions substantially corresponding to the lower rail cross-section, said member being disposed in mating relationship adjacent at least one end of the lower rail extending longitudinally for a portion of the length thereof providing lateral rigidity to the lower rail; and

means for fixing said reinforcing member to said lower rail.

4,892,283

STABLE MIRROR MOUNT

Ronald W. Cutburth, Bulls Gap, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 68,766, Jun. 29, 1987, abandoned, which is a continuation of Ser. No. 783,069, Oct. 3, 1985, abandoned, which is a continuation of Ser. No. 548,811, Nov. 4, 1984, abandoned. This application Jun. 16, 1988, Ser. No. 207,894

Int. Cl.[4] A47B *23/00*

U.S. Cl. 248—466 **8 Claims**

1. A mirror mount for supporting a mirror where said mirror is oriented in an X-ray plane, said mirror mount comprising

post assembly means for supporting the mirror,

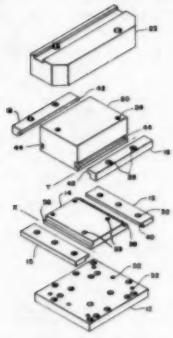
first keyway means for orienting said post assembly means such that said post assembly means are slidable only in a first direction parallel to a Y-axis orientation, and including first screw holes,

nut plate means for supporting said first keyway means and including second screw holes,

second keyway means for supporting said nut plate means such that said nut plate means are slidable only in a second direction normal to said first direction and parallel to an X-axis orientation such that said post assembly means and said nut plate means are each slidable in a plane parallel to said X-Y plane, and

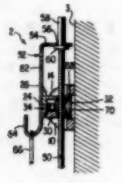
locking means normal to said X-Y plane including a single screw type locking member movable in a third direction

orthogonal to said first and second directions between a first position through said first and second screw holes for simultaneously locking in a single step in clamping engagement said first and second keyway means, said post



assembly means and said nut plate means in place in both said X-axis and said Y-axis orientation, and a second position for allowing said post assembly means and said nut plate means to slide freely in said X-axis and Y-axis orientations, respectively.

4,892,284
ADJUSTABLE HANGER
Joseph Kelrick, 4230 Casper Ct., Hollywood, Fla. 33021
Filed Dec. 23, 1988, Ser. No. 290,267
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—476 **15 Claims**



1. An adjustable device for hanging an object on a wall comprises:

means for attaching the device to the wall;

adjustable means for continuously moving the object in a first direction engaged with the means for attaching the device to the wall;

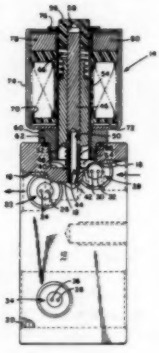
carrier means for engaging the adjustable means for continuously moving the object in the first direction;

adjustable means engaged with the carrier means for continuously moving the object in a second direction perpendicular to the first direction; and

means for attaching an object to the device engaged with the adjustable means for continuously moving the object in the second direction;

whereby an object hanging on a wall may be moved by adjusting one or both of the adjustable means without removing the object from the wall.

4,892,285
MODULATED ELECTRICALLY OPERATED REFRIGERANT EXPANSION VALVE
Robert J. Torrence, Addison, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Filed Apr. 29, 1988, Ser. No. 188,017
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.05 **25 Claims**



1. An electromagnetically operated valve assembly for use in controlling flow of compressed refrigerant in a refrigeration system, said assembly comprising:

(a) valve body means defining an inlet and outlet port;

(b) armature housing means formed of non-magnetic material attached to said body means and defining a valving chamber, said chamber communicating with said inlet port;

(c) an armature guide formed of non-magnetic material extending from said housing means, said guide defining a cavity therein, said cavity communicating with said outlet port and having at least one port therein communicating said cavity with said valving chamber;

(d) a hollow tubular armature formed of magnetic material and open at both ends received over said guide in closely fitting slidably movable arrangement with said guide extending therethrough, said armature movable between a first position covering said at least one port and any one of a plurality of second positions each at least partially uncovering at least one port, said armature in said closed position operative to provide a desired minimal residual refrigerant flow for compressor lubrication;

(e) means resiliently biasing said armature to said first position and limit means operable to resiliently oppose in the closed position movement of said armature in the direction of said bias;

(f) coil means disposed about said armature housing and operable upon electrical energization to provide sufficient magnetomotive force to move said armature from said first to any one of said second positions; and,

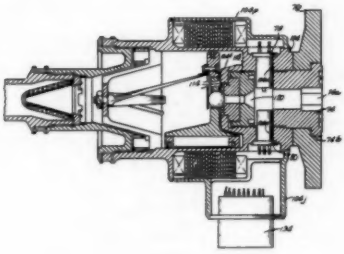
(g) pole frame means operable for completing a magnetic flux loop about said coil and through said armature and including a permanent magnet disposed about the exterior periphery of said armature housing means axially spaced from said armature, said magnet disposed exclusively about a periphery greater than the outer periphery of said armature.

4,892,286

FLUID CONTROL DEVICE

Robert H. Reinicke, Mission Viejo, and Jefferson Y. S. Yang, Orange, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 25, 1988, Ser. No. 147,829
Int. Cl.[4] F16K *31/04*
U.S. Cl. 251—129.11 26 Claims



1. A fluid control device comprising:

a housing having an inlet passage, an interior chamber communicating with said inlet passage, an outlet passage leading from said interior chamber, and a valve seat disposed in said outlet passage;

a brushless DC motor in said housing having a rotor supported in said interior chamber, bearing means providing for free rotary movement of said rotor and for free axial sliding movement independent of said rotary movement thereof of said rotor in said chamber, openings in said rotor permitting fluid passage therethrough, said rotor carrying a poppet closing off said outlet passage from said interior chamber in a de-energized condition of said motor; and

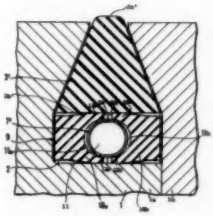
means effecting axial translation of said rotor in response to rotation thereof for moving said poppet away from said valve seat.

4,892,287

VALVE BODY WITH A HOUSING HAVING A CYLINDRICAL FLOW PASSAGE

Henri H. Weevers, Gouda, Netherlands, assignor to Mokveld Valves B.V., Gouda, Netherlands

Filed Sep. 16, 1988, Ser. No. 245,800
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731349
Int. Cl.[4] G16K *25/00*
U.S. Cl. 251—172 8 Claims



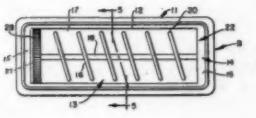
1. A valve having a longitudinal axis, comprising a housing having a cylindrical flow passage and a valve seat surface surrounding said flow passage between a high pressure side and a low pressure side, a valve piston axially movable in said housing and having a circumferential groove, sealing ring means arranged in said circumferential groove, said sealing ring means having a radially inner axially extending surface in said circumferential groove and a radially outer axially extending surface for cooperation with said valve seat surface, and spring ring means arranged in said circumferential groove for radially biasing said sealing ring means to press said radially outer surface of said sealing ring means radially outwardly against said valve seat surface, and channel means between said sealing ring means and a wall of said groove in said valve piston for exposing surfaces at least of said sealing ring means facing said high pressure side, to high pressure, said sealing ring means and said spring ring means having a mirror-symmetrical construction relative to a radial plane extending centrally through said valve perpendicularly to said longitudinal axis, said sealing ring means and said spring ring means retaining said mirror-symmetrical construction in a valve open condition and substantially in a valve closed condition to reduce wear and tear.

4,892,288

AIR FLOW LOUVER SYSTEM

Raymond L. Norbury, Jr., Dallas; John W. Baker, De Soto, and Vernon L. Poynter, Bedford, all of Tex., assignors to Cary Products Co., Inc., Dallas, Tex.

Filed Nov. 14, 1988, Ser. No. 270,833
Int. Cl.[4] F16K *1/226;* F24F *13/14*
U.S. Cl. 251—306 4 Claims



1. In a fluid flow control louver unit, having a holding frame defining an opening therein, with a fluid inlet at its back side and a fluid outlet at its front side, the improvement comprising a flexible unitary material rotor rotatably mounted within said frame for controlling the volume and direction of the fluid passing through said opening, and means for sealing all sides of said opening, and a rigid material wheel for turning said rotor attached to said rotor in said opening.

4,892,289

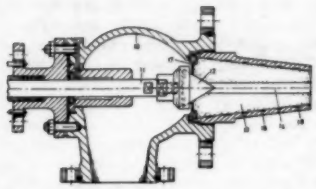
LETDOWN VALVES

Barney Van Dyk Burckard, Orkney, and Hermanus Pieterse, Vaal Reefs, both of South Africa, assignors to Crucible Societe Anonyme, Luxembourg, Luxembourg

Filed Dec. 22, 1982, Ser. No. 452,055
Claims priority, application South Africa, Dec. 23, 1981, 81/8895
Int. Cl.[4] F16K *31/00;* F16L *7/00*
U.S. Cl. 251—368 4 Claims

1. A letdown valve comprising a plug of hard ceramic material adapted to seat on a frustoconical seat in an axially bored throttle body also composed of a hard ceramic, the throttle body being received in a metallic sleeve, with the improvement that the throttle body is tapering and the metallic sleeve

is complementally tapered and in that a lubricant sealer is present between the body and the sleeve and a series of internal



grooves is formed in the sleeve to accomodate excess lubricant sealer.

4,892,290

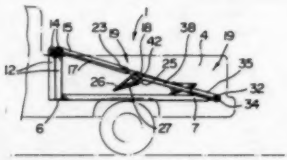
COMBINATION HOIST AND STAND

John A. Hart, Box 578, Claresholm, Alberta, Canada T0L 0T0

Filed May 16, 1988, Ser. No. 194,341

Int. Cl.[4] B66F 7/26

U.S. Cl. 254—49 **5 Claims**



1. A portable lift and stand device comprising an L-shaped extendible frame means for mounting on a vehicle in a collapsed condition and an extension slidable in said frame or movement between a storage position and an extended use position, leg means extendible between storage and ground engageable positions and pivotally connected to each end of said frame means for rotation between storage and inclined, ground engaging positions, whereby when said leg means are rotated from the stored to the ground engaging positions and the vehicle is moved in a first direction, said frame means is pushed to an erect, stand position, and subsequent movement of the vehicle in a second, opposite position leaves the device in an erect, standing position, said frame means being substantially L-shaped for engaging horizontal and vertical portions of a vehicle whereby during movement of the vehicle in said first direction, the vertical portion of the vehicle engages the vertical arm of the frame means to cause rotation of the frame means about the leg means to the erect position, and said frame means being extendible.

4,892,291

TWO-SPEED WINCH

Brian Shuker, Portsmouth, and Richard D. J. Huggett, Horndean, both of England, assignors to Lewmar Marine Limited, Havant, England

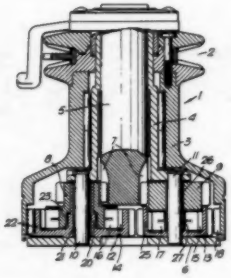
Continuation of Ser. No. 921,438, Oct. 22, 1986, abandoned, which is a division of Ser. No. 539,407, Oct. 6, 1983. This application Jul. 22, 1988, Ser. No. 224,218

Claims priority, application United Kingdom, Oct. 8, 1982, 8228815; Dec. 30, 1982, 8237000

Int. Cl.[4] B66D 1/14

U.S. Cl. 254—342 **10 Claims**

1. A winch having a central drive shaft and a drum, there being only two geared drive trains between the central drive shaft and the drum, each drive train including undirectional drive means, the said undirectional drive means being arranged so that drive is transmitted from the drive shaft to the drum by a different one of the drive trains according to the direction of rotation of the drive shaft, an inner wall of the drum having a gear ring defined thereon, said drive shaft having a single array of pinion teeth formed thereon, a first of the drive trains consisting of a first double gear and the second of the drive trains consisting of a second double gear, a first part of the double gears each having a gear track, the gear tracks ofthe first parts of the double gears meshing with each other and the gear track of the first part of the first double gear meshing with said gear



ring, a second part of each of the double gears each having a gear track, the gear tracks of the second parts of the double gears meshing in common with said single array of pinion teeth on the shaft, the said first part of the first double gear having a sleeve-like hub rotatably borne by an axle fixedly secured in the housing and said second part of the first double gear being rotatably supported on said sleeve-like hub of the first part over substantially the whole axial length thereof, said undirectional drive acting between the first and second parts of the first double gear.

4,892,292

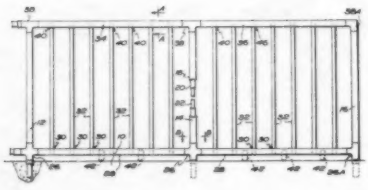
NON-CORROSIVE SECURITY RAILING

Thomas R. Russell, Miami, Fla., assignor to Saftron Inc., Miami, Fla.

Filed May 12, 1986, Ser. No. 862,252

Int. Cl.[4] E04H 17/14

U.S. Cl. 256—66 **14 Claims**



1. A security railing comprising:

a plurality of railing sections, each of said sections formed from an outer, plastics pipe having an outside dimension and an inner dimension and a second pipe, said second pipe having an inside dimension and an outside dimension essentially equal to the inside dimension of said first pipe, said second pipe inserted into said first pipe so that a portion of the second pipe projects beyond one end of the first pipe; a plurality of posts having upper and lower ends, each formed from one of said railing sections; a plurality of horizontal top rails, each formed from one of said railing sections;

T-shaped connector bodies between and connecting adja-

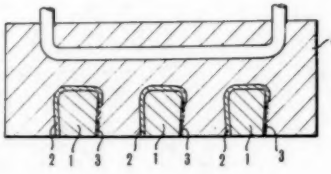
cent ones of said top rails and posts said connector bodies each having an inner bore essentially equal to the outside dimension of the second pipe and receiving said projecting portions of the second pipes of said connecting adjacent ones of said top rails and posts and an outside dimension essentially equal to the outside dimension of the outer pipe whereby the connector body forms smooth continuations of the outer pipes of said top rails and posts.

4,892,293

BRICK CASTING METHOD OF MAKING A STAVE COOLER

Yoichiro Kato; Hiroyuki Takao; Yasuhide Koga, and Tsuguro Takashima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,784
Claims priority, application Japan, May 25, 1988, 63-125842
Int. Cl.[4] C21B 7/10
U.S. Cl. 266—193 5 Claims



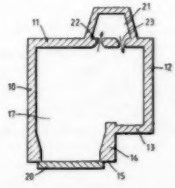
1. A method for producing a stave cooler having a cooling pipe for cooling a furnace wall and bricks embedded in a cast-iron stave body, said bricks being arranged in a horizontal row on a working side of stave cooler exposed to the furnace atmosphere, comprising covering said bricks on one of their upper and lower surfaces to be brought into contact with molten iron with metal wool and on the other surface with a heat-insulating buffer material and then pouring the molten iron around the brick row.

4,892,294

DEVICE FOR LIQUID PUMPING

Per-Olof Kagstrom, Finspang, Sweden, assignor to Granges Aluminium Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE88/00111, § 371 Date Jan. 9, 1989, § 102(e) Date Jan. 9, 1989, PCT Pub. No. WO88/07165, PCT Pub. Date Sep. 22, 1988
PCT Filed May 8, 1988, Ser. No. 299,330
Claims priority, application Sweden, Mar. 9, 1987, 8700966-8; Apr. 10, 1987, 8701514-5
Int. Cl.[4] F27D 23/04
U.S. Cl. 266—233 12 Claims



1. A device for liquid pumping, comprising

a main chamber and a pump chamber for receiving a subportion of the liquid to be pumped from said main chamber and which is provided with means for cyclic variation of the pressure in said pump chamber between a pressure greater than the pressure in said main chamber and a pressure less than the pressure in said main chamber, said pump chamber being connected to said main chamber by at least one input opening and at least one output opening, wherein

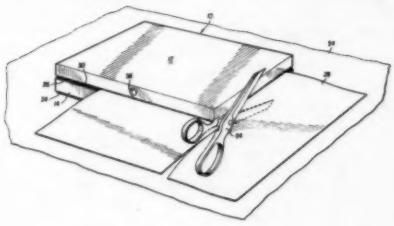
said input opening has a substantially lower flow resistance in the direction into said pump chamber than in the opposite direction and said output opening has a substantially lower flow resistance in the direction out of the pump chamber than in the opposite direction, so that when said pump chamber is at a pressure lower than the pressure in said main chamber a larger liquid quantity is sucked into the pump chamber through the input opening and when said pump chamber is at a pressure lower than the pressure in said main chamber a larger liquid quantity is forced out through the output opening than through the input opening, so that a net liquid quantity is sucked in through said input opening and forced out through said output opening.

4,892,295

PAPER CUTTING ASSIST

Jeanne N. Keller, 504 Gawain Ct., Virginia Beach, Va. 23464

Filed Dec. 7, 1988, Ser. No. 280,913
Int. Cl.[4] B25B 1/04
U.S. Cl. 269—8 10 Claims



1. A paper cutting assist for holding paper sheets when they are being cut, said paper cutting assist comprising:

a relatively flat substantially rectangularly shaped lid block defining a flat lid-jaw paper gripping surface on one side thereof;

a relatively flat substantially rectangularly shaped base block defining a flat base support surface on a first side thereof for supporting said base jaw block from a floor surface and a flat base-jaw paper-gripping surface on an opposite side thereof both said lid block and said base block having substantially solid interiors, each having approximately the same length and width dimensions as the other, with the width dimensions being at least 40% of the length dimension so that outer edges of the lid and base blocks are relatively even to each other;

a hinge means for hingedly attaching said lid-jaw block to said base-jaw block at hinge edges of said lid- and base-jaw blocks for allowing said lid- and base-jaw blocks to freely pivot relative to one another such that said flat lid- and bottom-jaw paper gripping surfaces can be closed on one another to be approximately in parallel contact one-to-the-other, and so that they can be pivoted away from one another;

a separate jaw non-slip layer of non-slip material mounted on one of said lid- and base-jaw paper-gripping surfaces for contacting a paper sheet placed between said lid- and base-jaw paper-gripping surfaces when they are closed on one another to inhibit relative sliding between said paper sheet and said lid- and base-jaw paper-gripping surfaces; and,

a base support non-slip layer of non-slip material mounted on said flat base support surface for contacting said floor surface to inhibit relative sliding between said floor surface and said flat base support surface;

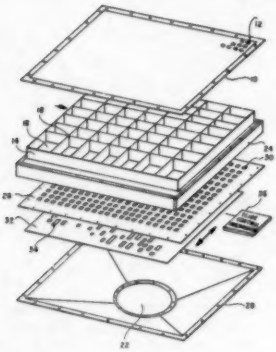
wherein said lid- and base-blocks are constructed of a sufficiently heavy material such that when said base support surface with said base support non-slip layer is resting on said floor surface and said flat lid-jaw paper-gripping surface is closed on said base jaw paper-gripping surface, with a sheet of paper therebetween, the weight of said lid- and base-jaw members maintains said paper holder stationary on said floor surface and maintains said sheet stationary in said paper holder to allow a user to cut the paper sheet with scissors.

4,892,296

SUCTION TABLE ASSEMBLY

Vaclav Jelinek, River Edge, N.J., assignor to SSMC Inc., Fairfield, N.J.

Filed Feb. 27, 1989, Ser. No. 316,044
Int. Cl.[4] B25B *11/00*
U.S. Cl. 269—21 **6 Claims**



1. A suction table assembly comprising:

a member having a hollow interior with open top and bottom horizontal ends;

a partition arrangement disposed in the interior of the member to partition the member interior into a plurality of cubicles having hollow interiors, each cubicle having open top and bottom horizontal ends respectively flush with the top and bottom ends of the member;

a first flat perforated horizontal plate overlying the member and connected to the top ends of all of the cubicles, the perforations in the plate communicating with the interiors of the underlying cubicles, the perforations having like areas and being regularly spaced;

suction producing means for producing suction forces, said suction producing means being disposed below the bottom ends of the member; and

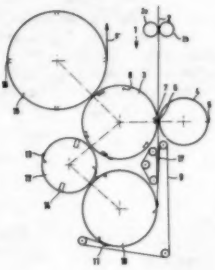
shutter means disposed between and connected to the bottom ends of the cubicles and the suction producing means, the shutter means applying the suction forces to the interiors of the cubicles, the shutter means having a plurality of different suction distributing positions, the amount of suction applied to each cubicle interior varying in accordance with each different suction distributing position, the shutter means including a second horizontal plate with regularly spaced openings of like area disposed below the bottom ends of the member, each opening having a substantially larger area than each perforation in the first plate.

4,892,297

COMBINATION SHEET FOLDING AND SELECTIVELY OPERABLE STAPLING APPARATUS

Ingo Kobler, Anhausen, Fed. Rep. of Germany, assignor to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,464
Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716451
Int. Cl.[4] B41L *43/10*
U.S. Cl. 270—38 **6 Claims**



1. Combination sheet handling apparatus for severing a web into sheets, for stapling the sheets and for folding the sheets, comprising the combination of

a combination, multifunction cylinder (3) having at least one cutting groove (6), at least one folding blade (8) and at least one group of grippers (7) thereon;

a cutting blade cylinder (4) having cutting knife blades (5) thereon;

the cutting blade cylinder (4) being operatively associated with the combination cylinder (3);

means (2*a*, 2*b*) for guiding a substrate web, or a plurality of superposed substrate webs (2) between said operatively associated combination cylinder (3) and said cutting blade cylinder (4) to provide for cutting said web or webs and to furnish a sequence of cut substrate elements (17);

transport means (9) receiving the cut substrate elements from the combination cylinder (3);

a collection cylinder (10) having grippers (11) located thereon and receiving the cut sheets from said transport means (9);

a transfer and stapling cylinder (12),

said transfer and stapling cylinder (12) having grippers (13) and stapling heads (14) thereon, said transfer and stapling cylinder receiving the cut substrate elements from the collection cylinder (10) gripping the cut substrate elements (17) with the grippers thereon and inserting staples therein;

a folding jaw cylinder (15) having folding jaws (16), operatively associated with the combination cylinder (3),

wherein said transfer and stapling cylinder (12) is further operatively associated with the combination cylinder (3) for transfer of the cut substrate elements (17) on the grippers (13) on the transfer and stapling cylinder (12)

back to the combination cylinder (3), and on the grippers (7) thereon, and

wherein the cutting grooves (6) on the combination cylinder, in cooperation with the operatively associated cutting blade cylinder (4) provides for cutting of the substrate web (2) into individual cut substrate elements (17) and for subsequent transfer to said transport means (9), and the folding blades (8) on the combination cylinder (3) provide for folding of the cut elements (17) transferred back thereto by the transfer and stapling cylinder (12) and for engagement into the folding jaws (16) of the folding jaw

cylinder and consequent placement of the then folded cut elements (17) on the folding jaw cylinder (15).

4,892,298

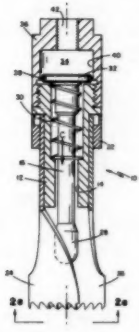
DEVICE AND METHOD FOR PICKUP OF SHEET-FORM FLEXIBLE FABRIC OR THE LIKE

Richard R. Walton, Ten W. Hill Pl., Boston, Mass. 02114, and George E. Munchbach, Roslindale, Mass., assignors to Richard R. Walton, Boston, Mass.

Continuation-in-part of Ser. No. 500,621, Jun. 2, 1983, Pat. No. 4,641,827, and a continuation-in-part of Ser. No. 614,478, May 30, 1984, Pat. No. 4,645,193. This application Sep. 22, 1986, Ser. No. 909,996

Int. Cl.[4] B65H *3/22*

U.S. Cl. 271—18.3 **11 Claims**



1. A pickup device for a piece of sheet-form flexible fabric or the like comprising:

first and second fabric gripping elements adapted to come together in a gripping position at the face of said fabric piece to grip a localized portion of the fabric,

said gripping elements defining gripping lines that come together in said gripping position,

support means for resiliently biasing said fabric gripping elements together in said gripping position,

support means for resiliently biasing said fabric gripping elements together in said gripping position,

said support means comprises a pair of elongated spring arms that are biased together,

actuatable separating means for applying force to said support means for overcoming said biasing,

said separating means comprises a carrying means slidable between opposed inner surfaces of said spring arms to progressively move said gripping elements and thus said gripping lines apart,

said gripping lines lying at an angle to a direction of movement of said spring arms,

upon deactuation of said separating means, said support means resiliently carries said gripping elements generally toward each other and laterally thereto in order to grip the fabric while applying tension to the fabric,

whereby, when the gripping elements reach a final gripping position, the fabric has previously been tensioned by motion of said gripping elements.

4,892,299

DOCUMENT FEEDER

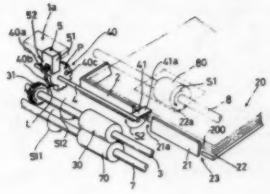
Hiroyoshi Hayama, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1988, Ser. No. 225,873

Claims priority, application Japan, Jul. 31, 1987, 62-193374

Int. Cl.[4] B65H *3/06*

U.S. Cl. 271—110 **8 Claims**



1. A document feeder, comprising:

a housing;

a document storing member disposed in said housing for storing a plurality of documents to be copied;

a document feed mechanism including a feed roller for feeding out the documents stored in the document storing member, and a forward rotation pickup roller and a backward rotation pickup roller arranged downstream of the feed roller, said forward rotation pickup roller and said backward rotation pickup roller being in contact with each other to deliver only one document at a time;

a drive shaft supported by said housing and carrying the backward rotation pickup roller and a drive gear coaxially with each other;

a rotary shaft carrying a driven gear, said driven gear including, peripherally thereof, a driven gear portion for meshing with said drive gear and a cutout portion out of mesh with said drive gear, said rotary shaft further carrying a document detector mounted coaxially with said driven gear for contacting the documents on said document storing member and detecting the presence and absence of the documents; and

a sensor for detecting angular movement of said driven gear.

4,892,300

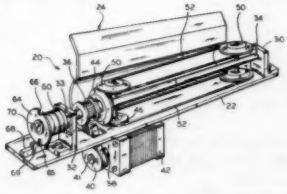
DIFFERENTIAL DOCUMENT DRIVE

Eduard Svyatsky, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 25, 1988, Ser. No. 198,472

Int. Cl.[4] B65H *5/02*

U.S. Cl. 271—225 **30 Claims**



1. A differential motion translating and document drive delivery system wherein said system includes power means, first means for delivery of documents sequentially along a first path, means for establishing orientation relative to a planar reference means, and means related to said first delivery means

for translating the direction of movement of said documents angularly relative to said first path along a second path said paths being generally perpendicular and hence said second path is substantially parallel relative to said reference said translating means including means having a substantially line contact with said document for controlling movement of said document, said translating means further including means for converting rotary motion along said first path to linear motion along said second path, and in addition said related means has a planetary mechanism consisting of a sun gear and at least one planetary gear, said sun gear being mounted on a hollow cylindrical member coaxially supported by bearing means on a central shaft means.

4,892,301

SHEET FEEDER AND ACCELERATOR

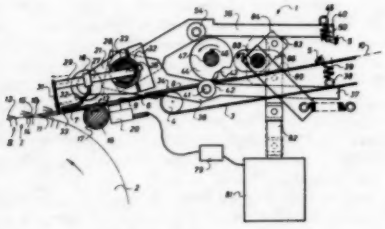
Claus D. Barrois, Markthiedenfeld, and Philipp A. Dieterich, Randersacker, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,729

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731216

Int. Cl.[4] B65H *5/06*

U.S. Cl. 271—227 **5 Claims**



1. A sheet feeding and accelerating assembly for feeding sheets aligned by front register lays to a sheet-treating machine and for selectively controlling an initial tension applied to the sheets, said sheet feeding and accelerating assembly comprising:

means to forward said sheets to the sheet-treating machine;

a driven accelerating roller and at least one cooperating pressure roller for periodically contacting said sheets on said means to forward said sheets; and

means for adjustably controlling the time of contact of said at least one pressure roller with said accelerating roller, including a drivable control drum on which a control roller for said at least one pressure roller runs, said control drum having an axially extending control recess whose opening angle varies axially and wherein said control roller and said control drum are shiftable axially with respect to each other.

4,892,302

JUMPING SKILL TRAINING GAME

Dennis L. Daigle, 1004 - 155th St., West, Burnsville, Minn. 55337

Filed Dec. 9, 1988, Ser. No. 281,794

Int. Cl.[4] A63B *5/22, 67/00;* **A63K** *3/04*

U.S. Cl. 272—74 **6 Claims**

1. A skill training game, comprising

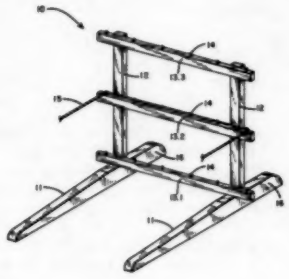
(a) a pair of substantially identical frames adapted for spaced-apart, independently supported positioning, each frame comprising

(i) a pair of spaced apart foot members;

(ii) an upwardly projecting post affixed to each foot member;

(iii) a plurality of spaced-apart crossing members bridging between said posts, each crossing member having a plurality of regularly spaced retainers;

(b) an elongate elastic cord adapted for connection about one or more retainers and for extending between said



frames whereby said retainers align said cord in parallel segments and said parallel segments provide obstacles for jumping, and wherein the lateral spacing between the parallel segments and the distance of said segments from a support surface may be changed.

4,892,303

SPORT FENCING DEVICE

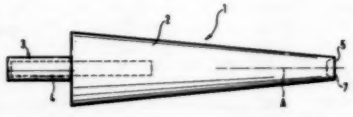
Günther Lohre, Reinsburgstrasse 111, D-7000, Stuttgart 1, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,670

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1987, 3728187

Int. Cl.[4] A63B *69/02*

U.S. Cl. 272—98 **14 Claims**



1. A sport fencing device, comprising

an oblong striking element including a longitudinal axis made from a foam material, said striking element being conic in shape and including a narrow end and a wide end, said narrow end including an end face,

a handle attached to said striking element adjacent said wide end,

a stabilizing element interconnecting said striking element with said handle, said stabilizing element extending approximately one-third of the way into said striking element, and

electronic hit detection means integrated into said end face for detecting when said end face makes a hit with a surface along said longitudinal axis.

4,892,304

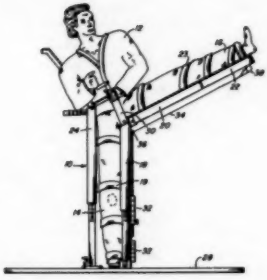
LEG STRENGTHENING AND STRETCHING APPARATUS

Vincent L. DeNiro, 490 W. Midmorning Blvd., Youngstown, Ohio 44511

Continuation-in-part of Ser. No. 37,693, Apr. 13, 1987, abandoned. This application Aug. 19, 1988, Ser. No. 234,403

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—126 23 Claims



1. Leg strengthening and stretching apparatus for aiding in the development of leg muscles of a user utilized in a kicking motion, including:

a body support for supporting the user in an upstanding position, said body support being comprised of a support leg retainer for retaining one leg of the user in an upright support position and a torso support for supporting the torso of the user in a desired position;

a first exercise leg support extending from said support leg retainer at a desired angle for supporting an upper leg of the user thereupon; and

a second exercise leg support rotatably attached at an end portion of said first exercise leg support for supporting a lower leg portion of the user thereupon.

4,892,305

EXERCISING DEVICE

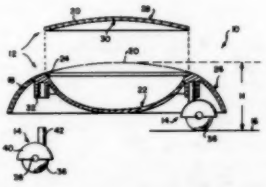
Peter G. Lynch, 166 Woodway, Glencairn, Cape Town, Cape Province, South Africa

Filed Dec. 21, 1987, Ser. No. 136,142

Claims priority, application South Africa, Dec. 22, 1986, 86/9629

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—127 7 Claims



1. An exercising device which comprises a platform and three or more caster wheels underneath the platform, the for supporting a limb of a user on or against a supporting surface while permitting movement of the limb in any direction along the supporting surface:

the platform comprising a lower body part and a removable upper part;

the body part comprising a central portion having a concave uppper surface, and a skirt portion which extends peripherally of the central portion;

the central portion and the skirt portion defining between them, on the underside of the body part, a downwardly open annular recess;

the caster wheels being mounted underneath the body part so as to be partly accommodated in, and protrude downwardly from, said annular recess; and

said upper part being such that, when supported in position on the body part, it extends across said concave upper surface.

4,892,306

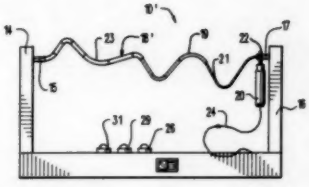
ELECTRICAL HAND STEADINESS TESTING GAME

Ibrahim M. Kawar, 2411 Glenallen Ave. H90 204, Silver Spring, Md. 20906

Filed May 23, 1989, Ser. No. 355,429

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—1 GA 10 Claims



1. An electrical steadiness testing game, comprising:

a base;

a pair of spaced upstanding supports on said base;

a plurality of sequentially stepped diameter cylindrical segments interconnected to form an electrically conductive track member between said supports;

means rotatably connecting at least some adjacent segments of said track member to allow changing of a path defined by said track member;

an electrically conductive ring member received around said track member;

an insulated manually manipulable handle secured to said ring member;

power supply means; and

indicating means operably connected with said power supply means, said track member and said ring member for actuation upon contact of said ring member with said track member.

4,892,307

BALANCING STICK TOY

Arthur N. Lehberger, 256 Winfield Ter., Union, N.J. 07083

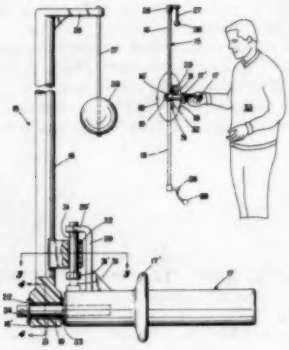
Filed Mar. 13, 1989, Ser. No. 322,344

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—1 GF 5 Claims

1. In a balancing stick toy, a handle member having a forwardly-extending pivot shaft, a weighted balancing stick member having its lower end pivotally connected to the pivot shaft to normally turn freely thereabout and releasable means carried on one of the members and engagable with the other member so that upon turning the handle about its longitudinal

axis by the hand of the user the balance stick may be brought from a depending position to an upright position and is auto-



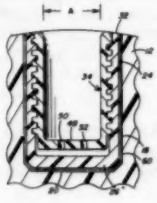
matically releasable to carry out the balancing exercise of the stick about the handle member.

4,892,308

BOWLING BALL AND FINGER INSERT THEREOF

Ray P. Gaunt, P.O. Box 181, New Brighton, Pa. 15066

Filed Oct. 17, 1988, Ser. No. 258,636
Int. Cl.[4] A63B *37/00*
U.S. Cl. 273—63 B 6 Claims



1. A bowling ball having a variable internal diameter finger hole comprising,

a bowling ball having an oversized cylindrical finger hole therein having the shape of a cylinder throughout its length,

a rigid liner insert having the shape of a cylinder throughout its length and having a cylindrical outer surface and an inner cylindrical bore, said inner cylindrical bore having an internal threaded portion, means for adhesively securing said liner insert in said oversized finger hole,

a cylindrical finger receiving insert having an internal bore of a preselected diameter and an external cylindrical surface with external threads formed thereon,

said finger receiving insert threadedly secured in said liner insert, and

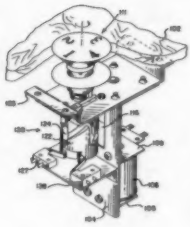
means to threadably remove said finger receiving insert from said liner insert and threadably securing a second finger receiving insert having a different internal diameter in said liner insert.

4,892,309

TWO AND FOUR POSITION TARGET ASSEMBLY

Mark S. Kim, Chicago, and Gary L. Berge, Crystal Lake, both of Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.

Division of Ser. No. 18,480, Feb. 25, 1987, Pat. No. 4,822,046.
This application Dec. 14, 1988, Ser. No. 284,255
Int. Cl.[4] A63F *7/00*
U.S. Cl. 273—127 R 5 Claims



1. In a flipper-type pinball game machine of the type having an inclined playfield having an opening therein and which supports a rolling ball and one or more play features, the improved play feature comprising:

(a) ball target means extending through said opening to be contacted by a ball rolling on said playfield;

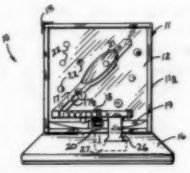
(b) means for rotating said ball target to a plurality of predetermined positions, said positioning means include: i linear actuating means and ii cam means engaging said linear actuating means to control movement of said ball target means to said predetermined positions.

4,892,310

RANDOM NUMBER SELECTION APPARATUS

Leonard H. Patterson, 740 Birmingham St., Bridgeport, Conn. 06606

Filed Dec. 5, 1988, Ser. No. 279,511
Int. Cl.[4] A63F *5/00*
U.S. Cl. 273—144 A 8 Claims



1. A random ball selector apparatus for random selection of a pre-selected number of digits from a plurality of spheres, said apparatus comprising,

a stationary transparent enclosure formed with an opaque base portion, spaced transparent side panels, and spaced transparent end panels;

a plurality of spheres;

a pressurizing means formed in said base to project and direct airborne a plurality of spheres within said enclosure wherein each sphere includes at least one numerical digital display thereon, and

a first chute diagonally oriented from an upper level of said enclosure to a lower level of said enclosure, and

a catch means positioned within said first chute for catching the airborne spheres within said enclosure and directing said spheres downwardly within said first chute, and

a second chute angularly disposed and and associated with

said first chute to accept spheres within said second chute and to randomly secure a preselected number of said spheres within said second chute for random selection of digits imprinted on said spheres, and

wherein each of said spheres has formed thereon a plurality of numerical digits equally spaced about a surface of each sphere, and

wherein each of said digits is of a first magnetic polarity and wherein a pre-selected number of magnetic members of a reverse second magnetic polarity is formed in a top surface of said second chute for alignment of selective ones of said digits within said chute.

4,892,311

GAME PLAYING MACHINE EQUIPPED WITH A VIBRATING FEEDER

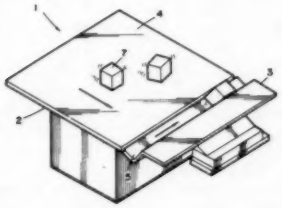
Kouji Zaitsu, Yokohama, Japan, assignor to Bonanza Enterprises, Ltd., Yokohama, Japan

Filed Sep. 6, 1988, Ser. No. 240,722

Claims priority, application Japan, Dec. 18, 1987, 62-192332[U]; Apr. 29, 1988, 63-58104[U]

Int. Cl.⁴ A63F *9/04*

U.S. Cl. 273—145 D **6 Claims**



1. A die throwing machine comprising:

a vibrating feeder on which a die is to be thrown, said feeder having at least two divisional sections integrally connected with each other, a first divisional section and a second divisional section, said first divisional section receiving a thrown die and having a vibratory transporting surface large enough to receive the die and allow it to rotate in all directions while transporting it toward said second divisional section, said second divisional section having spot counting means for counting the number of spots of a selected side of said die and a vibratory transporting channel along which the die is linearly transported to a counting place at which the spot counting means is provided.

4,892,312

OPERATING DEVICE FOR TV GAME MACHINE

Hideki Minemoto, and Hisayuki Yamaguchi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Taito, Tokyo, Japan

PCT No. PCT/JP86/00487, § 371 Date Mar. 3, 1988, § 102(e) Date Mar. 3, 1988, PCT Pub. No. WO88/00489, PCT Pub. Date Jan. 28, 1988

PCT Filed Sep. 19, 1986, Ser. No. 188,409

Claims priority, application Japan, Jul. 18, 1986, 61-111133

Int. Cl.⁴ A63B *17/04*; G01D *5/34*; H03M *1/26*; F16H *13/00*

U.S. Cl. 273—148 B **11 Claims**

1. An operating device for a TV game machine for inputting coordinate positions of a controlled object that move across a screen of said TV game machine, comprising:

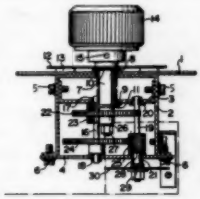
a base assembly mounted on a control box of a game machine body;

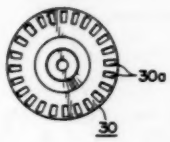
a main shaft rotatably mounted on said base assembly;

an operating knob mounted on an end of said main shaft for rotating said main shaft;

a rotational number increasing mechanism housed within said base assembly, said rotational number increasing mechanism increasing the rotational number of said main shaft;

a disk fixed to an output shaft of said rotational number





increasing mechanism and having a plurality of holes or notches in its periphery; and

a sensor section for detecting said holes or said notches of said disk.

4,892,313

LOTTERY TICKET REVIEWING DEVICE

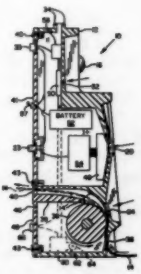
Jimmie J. James, and Susanna M. James, both of 1 Woodland Ct., Novato, Calif. 94947

Continuation-in-part of Ser. No. 98,809, Sep. 21, 1987, Pat. No. 4,772,025. This application Sep. 19, 1988, Ser. No. 246,286

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁴ A63F *3/06*

U.S. Cl. 273—148 R **9 Claims**



1. A device for comparing lottery tickets to winning lottery numbers, in a lottery game wherein a series of numbers are selected by customers, which if successfully selected will match a series of winning numbers drawn in the lottery, comprising:

a housing generally in the configuration of and having the appearance of a slot machine, but smaller in size,

a series of manually settable number displays mounted for viewing at the front of the housing, each number display having a range of all possible numbers which can poten-

tially be selected in the lottery for each number position, the number of number displays being at least equal to the number of numbers to be selected in the lottery drawing for which the device is used, with means enabling the user/lottery customer to set the number displays to match the winning numbers selected in a lottery drawing, with the series of winning numbers appearing in a horizontal series at the front of the device,

a lottery ticket infeed slot in the front of the housing,

rotatable ticket feed means in the housing and adjacent to the infeed slot, including means for enabling the user/lottery customer to cause the rotatable feed means to rotate and to advance a lottery ticket into and through the housing when the lottery ticket is placed in the infeed slot,

ticket viewing window means in the front of the housing, in a generally linear horizontal arrangement and positioned so that numbers on a lottery ticket are viewable through the window means, with a ticket number directly adjacent to and generally aligned vertically with each of the manually set lottery winning numbers visible at the front of the device,

and an outfeed slot in the device, through which the lottery ticket exits the device,

whereby the user can first determine the published winning numbers in a lottery and set the plurality of number displays accordingly to expose the series of winning lottery numbers on the number displays at the front of the machine, arranged in a horizontal line in a prescribed sequence as published, then feed into the device a lottery ticket having customer-selected series of numbers, advance the lottery ticket into the device to a point where the first row of numbers on the ticket is directly behind the window means and thus adjacent to the manually input numbers on the number displays, number by number, and make a comparison of the numbers; and if multiple series of customer-selected lottery numbers are on the lottery ticket, the user can review each series of numbers sequentially, comparing them with the adjacent series of winning numbers and advancing the lottery ticket forward through the device to position the next series of numbers on the ticket behind the viewing windows, make another comparison, and so on.

4,892,314

GOLF PUTTER WITH DETACHABLE DIVOT MENDER STORED IN GRIP

Joseph F. Rango, 39770 St. Michel Fl., Palm Desert, Calif. 92260

Continuation-in-part of Ser. No. 111,864, Oct. 23, 1987, Pat. No. 4,799,684. This application Jan. 17, 1989, Ser. No. 298,125

Int. Cl.[4] A63B *53/00*

U.S. Cl. 273—162 D **2 Claims**

1. A golf putter including a shaft with a hollow end and having a hand grip which surrounds the upper end of the shaft, and a divot mending device positioned within such hollow end said shaft and hand grip also having a cap portion overlying the end thereof and an opening formed in said cap portion having a diameter smaller than the diameter of said shaft at the end thereof, said divot mending device having a sleeve or body portion including a tined strip depending therefrom, said body portion having a diameter corresponding substantially to that of the said opening in said cap portion but sufficient to be frictionally engaged thereby, said body portion with said tined strip being thereby positioned within the inner wall of said shaft when inserted therein, and a cap member affixed to or integral with said body portion which overlies the end of said shaft and said cap portion in which said opening has been made to form an end cap for said shaft.

4,892,315

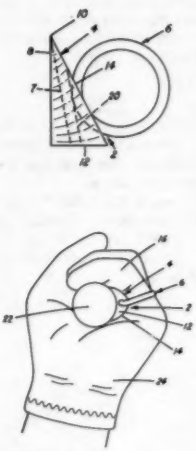
GOLF HAND PAD DEVICE

Alfred Iorlano, 3106 Grove Rd., Palm Beach Gardens, Fla. 33410

Filed Aug. 4, 1988, Ser. No. 228,162

Int. Cl.[4] A63B *53/14;* **A41D** *19/00*

U.S. Cl. 273—166 **11 Claims**



1. A golf hand pad device comprising a tapered hand pad for positioning on a golfer's upper hand adjacent the base of the little finger, said tapered hand pad having an elongated groove tapered along its length for receiving the grip portion on a golf club shaft, means for positioning and maintaining said tapered hand pad on a golfer's upper hand.

4,892,316

GOLF CLUB HEAD

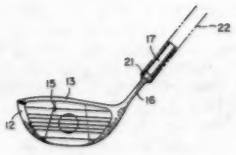
H. E. Langert, Del Mar, and Horst Kraft, Sylmar, both of Calif., assignors to Langert Golf Co., Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 101,739, Sep. 28, 1987, Pat. No. 4,809,983. This application Feb. 22, 1989, Ser. No. 313,742

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[4] A63B *53/04, 53/02*

U.S. Cl. 273—167 E **15 Claims**



1. A golf club head having a body formed with a top, a generally flat sole plate, a toe end and a heel end, and a generally flat ball striking face extending between the top and the sole plate at an angle with respect to the vertical, said golf club head comprising:

a shank having a longitudinal axis extending generally upwardly from said heel end of said body; and

hosel means extending axially upward from said shank, said hosel means providing means for connecting said golf club

head to an elongated shaft, said hosel means being formed generally as a cylinder;

said shank having a cross section which is relatively thin in one plane and relatively wide in another plane generally perpendicular to said one plane, thereby forming a foil configuration which is symmetrical about said longitudinal axis with a long axis through said wide plane extending between a leading edge of said foil through a trailing edge;

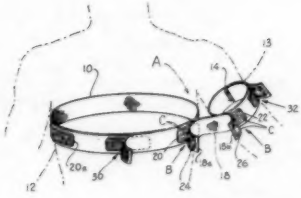
whereby the shape of said shank results in reduced drag as the golf club head passes through the air, and an improved ratio of body mass to shank mass, both as compared with a golf club head having a round shank, thereby resulting in more mass at greater speed for the same energy applied to swinging the club.

4,892,317

GOLF CLUB SWING TRAINING DEVICE

William O. Corder, Jr., 1003 Windwood Dr., Anderson, S.C. 29621

Filed Jul. 13, 1988, Ser. No. 218,279
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B **11 Claims**



1. A golf swing training device comprising:

a chest strap for encircling the chest of a golfer;

an arm strap for encircling an upper arm of the golfer;

a first piece carried on an exterior of said chest strap near an armpit of said golfer;

a second piece carried by the exterior of said arm strap generally near said armpit and facing said first piece;

a connector strap for interconnecting said chest and arm straps;

a third piece carried by a first end of said arm strap mating with said first piece to form a first connection;

a fourth piece carried by a second end of said connector strap mating with said second piece carried by said arm strap to form a second connection;

at least one of said first and second connections being a releasable connection which releases when the swing of said golfer's arm exceeds a desired movement to prevent injury to said golfer; and

said pieces of said releasable connection include hook and loop pieces which tear from each other when said swing exceeds said desired movement to provide a discernible audible signal for memory training of the muscles to train for a correct golf swing.

4,892,318

GOLF BALL STORAGE, DISPENSING AND TEEING APPARATUS

Kenneth L. Jennings, Rte. 2, Box 83-4, Strafford, Mo. 65757

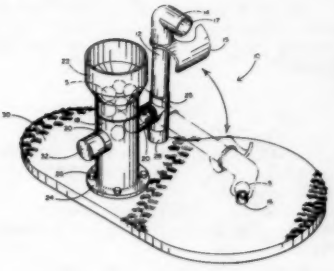
Filed Jul. 25, 1988, Ser. No. 223,433
Int. Cl.[4] A63B *57/00*
U.S. Cl. 273—201 **7 Claims**

1. A gravity activated golf ball teeing apparatus comprising:

a cylinder for storing a plurality of golf balls, said cylinder having a pair of opposed coaxial apertures defining an axis which is substantially perpendicular to the axis of said cylinder;

a fixed tube extending through said apertures, said fixed tube having a cutout portion within said cylinder;

a swing tube lying substantially coaxially within said fixed tube and also having a cutout portion, the interior diameter of said swing tube being properly dimensioned for receiving a plurality of serially arrayed golf balls, the outer diameter of said swing tube being smaller than the inner diameter of said fixed tube to permit rotation of said swing tube within said fixed tube and to permit the axes of said fixed tube and swing tube respectively to define a non-zero angle to promote the gravitational flow of said serially arrayed golf balls toward one end of said swing tube;



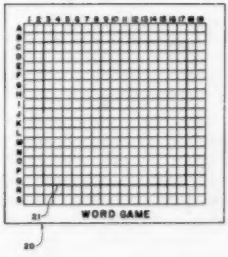
an articulated tubular arm affixed perpendicularly to said one end of said swing tube exterior of said cylinder, said tubular arm providing a path for said serially arrayed golf balls within said swing tube and an exit aperture at one end thereof spaced from said one end of said swing tube and through which exit aperture said golf balls may be selectively delivered onto a tee, said arm also having a weight positioned at the end thereof opposite said exit aperture end, said swing tube being affixed to said tubular arm intermediate of said exit aperture end and said weight end of said tubular arm whereby said tubular arm is normally in a substantially vertical position and releases a golf ball through said exit aperture onto said tee when said exit aperture end of said tubular arm is rotated into a position below horizontal.

4,892,319

WORD GAME

Theodore D. Johnson, II, 3900 Pebble Creek Rd., Midlothian, Va. 23112

Filed Jul. 20, 1988, Ser. No. 221,555
Int. Cl.[4] A63F *3/00, 9/04*
U.S. Cl. 273—272 **8 Claims**



1. 1 A word game comprising:

a playing area;

a matrix of letter spaces in said playing area;

a plurality of playing tiles for playing in said letter spaces, said tiles have thereon varying letters of the alphabet and bonus letters indicia;

a random number selector for the chance selection of a single number from up to at least 30 or more;

a code for converting said randomly selected numbers to a single constant letter of the alphabet or bonus letter with said chance selection of numbers approximating the frequency of letter usage in word games;

said playing tiles selected by said chance selection of numbers and said code conversion of the numbers being initially arranged and played by a player of the game to form a word as that player's territory in said playing spaces at a corner of said matrix of said playing area with subsequent playing tiles added at the player's turn to the player's territory in cross-word fashion when additional words can be created.

4,892,320

STUFFING BOX ASSEMBLY

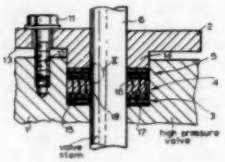
Hans-Joachim Tückmantel, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to Kempchen & Co. GmbH, Oberhausen, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,019

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3721967

Int. Cl.[4] F16J *15/28, 15/30;* F16K *41/02*

U.S. Cl. 277—125 **20 Claims**



1. A stuffing box seal assembly, comprising:

a seal housing formed with a seal chamber opening at a surface of said housing and surrounding a spindle movable relative to said housing;

a packing gland surrounding said spindle and tightenable against said housing; and

a seal in said chamber under compression from said gland, said seal comprising:

a coiled graphite pressed ring in said chamber and including a spirally coiled strip of expanded graphite having turns interleaved with a metal strip extending around said spindle and under axial compression, and

at least one laminate ring on an axial side of said coiled graphite pressed ring, said laminate ring comprising a plurality of stacked annular disk layers of expanded graphite extending generally transversely to an axis 7 of said spindle and axially pressed toward each other and limiting adhesion of material from said coiled graphite pressed ring to said spindle upon movement thereof relative to said housing.

4,892,321

ULTRA-HIGH VACUUM DEVICE GASKET WITH MEANS OF INSERTION AND REMOVAL

Samuel O. Colgate, 4132 NW. 38 St., Gainesville, Fla. 32606, and Grant M. Schrag, 8114 SW. 53rd Pl., Gainesville, Fla. 32608

Filed Jun. 16, 1988, Ser. No. 207,533

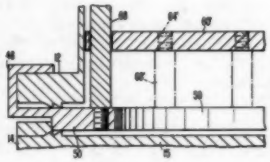
Int. Cl.[4] F16L *19/00*

U.S. Cl. 277—167.5 **24 Claims**

13. A bakeable gasket for insertion between flanges of an ultra-high vacuum device, the flanges each having at least one sealing surface, comprising:

(a) a generally annular gasket portion substantially traversing the shape of an O-ring; and

(b) integral handling means attached to said annular portion for inserting said gasket in and for removing said gasket from the flange sealing surfaces,



whereby said handling means are adapted to be disposed outside the flange sealing surfaces and said ultra-high vacuum device after insertion and further adapted to avoid impairment of the sealing properties of the ultra-high vacuum device.

4,892,322

LOUVER GASKET

Coleman L. Koza, 321 Laclie Street, Orillia, Ontario, Canada L3V4P2 , and Lawrence J. Koza, 42 Cairns Boulevard, Barrie, Ontario, Canada L4M4S7

Filed Apr. 12, 1988, Ser. No. 180,752

Claims priority, application Canada, Mar. 23, 1988, 562227

Int. Cl.[4] F16J *15/00*

U.S. Cl. 277—207 R **7 Claims**

1. A gasket for use with a ventilation louver of the kind having a base and a sidewall, said gasket having a body arranged in a closed polygonal loop with an open interior for receiving said louver, said body having a generally concave circumferential radially inwardly facing surface adapted to encircle and press against said sidewall of said louver, a generally concave circumferential rearwardly facing surface adapted to press against a construction material covering the base of said louver, and a circumferential front surface, said front surface being at least partly concave, said circumferential front surface and said circumferential radially inwardly facing surface meeting in a thin radially inwardly extending circumferential lip, said lip being adapted to press sealingly against said sidewall, said circumferential radially inwardly facing surface and said circumferential rearwardly facing surface meeting at an acute angle.

4,892,323

ALL-TERRAIN WHEELCHAIR

Stuart G. Oxford, 7817 Crown Point Ave., Omaha, Nebr. 68134

Filed Oct. 27, 1988, Ser. No. 263,417

Int. Cl.[4] B62M *1/14, 1/16*

U.S. Cl. 280—250.1 **6 Claims**

1. An all-terrain wheelchair comprising:

an elongated frame means having rearward and forward ends;

a pair of laterally extending axle members positioned adjacent to the rearward end of said frame menas;

a pair of wheels rotatably mounted on said axle members and positioned laterally of the rearward end of said frame means;

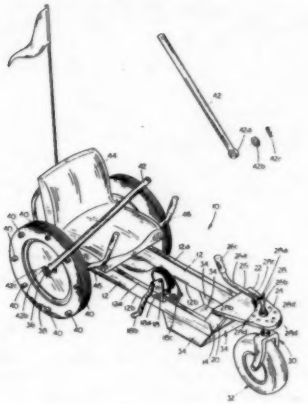
a seat means on said frame means positioned between said wheels;

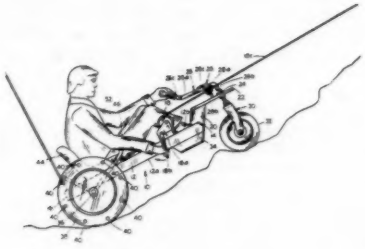
a ground engaging steerable wheel mounted at the forward end of said frame means;

a steering means connected to said steerable wheel for steering said steerable wheel;

each of said wheels of said pair of wheels having a plurality

of radially spaced apart tubular members secured thereto which extend horizontally outwardly therefrom and which are disposed parallel to the axis of rotation of said wheels;





and a pair of elongated arms selectively removably secured at one end thereof to said axle members for selective engagement with said tubular members to permit the user of the wheelchair to apply additional propelling force to the wheels through the use of said arms.

4,892,324

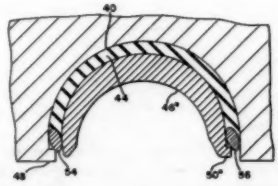
FIFTH WHEEL MOUNTING PAD

Charles P. Spencer, Staunton, Ill.; Terry L. Pitchford, St. Louis, Mo., and Robert P. Radwill, Burr Ridge, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Aug. 22, 1988, Ser. No. 234,517

Int. Cl.[4] B62D 53/08

U.S. Cl. 280—440 **12 Claims**



1. An improved fifth wheel mounting wherein mounting brackets attached to a tractor frame have arcuate bearing surfaces that are received within pockets on the underside of the fifth wheel toward arcuate pocket surfaces therein with an arcuate shoe placed between said surfaces, said improvement comprising:

an inwardly directed ledge at each end of one of said arcuate pocket surface and said arcuate shoe, said ledge reducing but not closing an open space between said arcuate pocket surface and said shoe;

a resilient elastomer pad interposed between said arcuate pocket surface and said shoe said pad having an end proximate each said inwardly directly ledge;

and a non-extrudable end member located at each end of said pad and between said arcuate bearing surface and said arcuate shoe and inwardly of each ledge, said end member extending substantially the width of said elastomer pad whereby to completely block extrusion of said pad from the inside between said arcuate pocket surface and shoe when a load is placed on said fifth wheel causing said pad to be compressed while still allowing for relative movement between said arcuate pocket surface and said shoe to provide a cushioning effect.

4,892,325

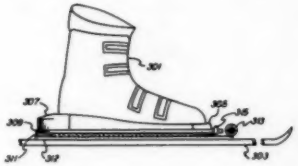
MOTION DETECTOR

Nicholas F. D'Antonio, 7695 Admiral Dr., Liverpool, N.Y. 13088

Filed Jan. 8, 1982, Ser. No. 338,092

Int. Cl.[4] A63C 9/08

U.S. Cl. 280—612 **21 Claims**



1. An electronic motion detector for detecting at least one direction of relative lateral movement of two bodies and the magnitude of that movement, said detector comprising:

source means for activating said detector;

sensing means having a plurality of electrical values changeable in response to the lateral movement of said source means with respect to said sensing means;

measuring means connected to said sensing means for interpreting changes in said electrical values and generating output signals indicating the direction and magnitude of said lateral movement; and,

electronic adjusting means connected to said measuring means for adjusting one of said output signals according to a predetermined criterion to produce an adjusted output signal, said electronic adjusting means comprising an electronic balancing means which generates a balancing signal of variable magnitude and adds said balancing signal to one of said output signals, when said source means has not moved with respect to said sensing means, to produce a summed output signal having a near-zero magnitude, said electronic balancing means comprising:

counting means for producing a counting signal changing stepwise in magnitude in one direction with time;

reference signal means for producing a balance reference signal having magnitude near zero relative to the stepwise changes of said counting signal;

switch means, connected to said counting means, for enabling said counting means and for resetting said counting signal to zero upon receipt of a balancing command;

adding means, receiving said output and counting signals, for adding said counting signal and said output signal to

produce said summed output signal having an absolute magnitude approaching that of said balancing reference signal; and

first comparison means receiving said summed output and balance reference signals, for comparing said summed output signal to said balance reference signal and connected to said counting means, for disabling said counting means when the absolute magnitude of said summed output signal falls below the absolute magnitude of said balance reference signal.

4,892,326

NON-SOLE DEPENDENT SKI BINDING

Josef Svoboda, Schwechat, and Radko Pavlovec, Wien, both of Austria, assignors to TMC Corporation, Switzerland

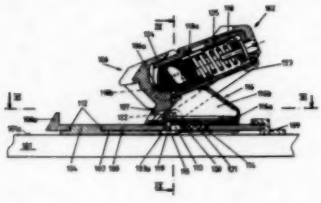
PCT No. PCT/EP87/00081, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/04940, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 14, 1987, Ser. No. 116,729

Claims priority, application Austria, Feb. 17, 1986, 408/86

Int. Cl.[4] A63C 9/082

U.S. Cl. 280—618 13 Claims



1. A safety ski binding for releasably securing a ski boot to a ski having a tip end and a rear end, the binding comprising:

an elongated base plate having a first surface disposed to be mounted on a ski, a second surface opposite said first surface, and a cam surface disposed on an edge of said base plate:

a pivot axle extending from said second surface of said base plate;

an elongated support plate pivotably mounted on said base plate about said pivot axle, said support plate having an oblong cam axle opening and an oblong lug opening, said openings extending in the longitudinal direction of the support plate;

a heel support having a bearing block portion and a sole holding portion pivotably mounted on said bearing block portion for pivotal movement between a sole locking and a sole releasing position, said bearing block portion mounted on said elongated support plate for longitudinal movement along said support plate, said heel support including a cam axle extending through said cam axle opening and a lug extending through said lug opening;

a cam roller disposed on said cam axle for rolling engagement with said cam surface of said base plate, said cam roller and said cam surface cooperating to move said heel support in the direction of the rear end of said ski when said sole plate is pivoted about said pivot axle; and

spring means disposed between an edge of said lug opening and said lug for biasing said cam roller against said cam surface.

4,892,327

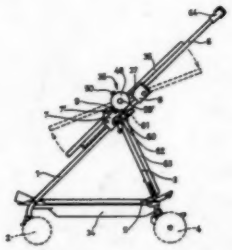
FOLDABLE FRAMES FOR CHILDREN'S PUSHCHAIRS

Ramón J. Cabagnero, Barcelona, Spain, assignor to Jané, S.A., Barcelona, Spain

Filed Apr. 5, 1988, Ser. No. 177,633

Int. Cl.[4] B62B 7/08

U.S. Cl. 280—650 15 Claims



1. A carriage comprising a base frame having a front end and an opposite base frame rear end, a front leg having a lower front leg end pivotally connected to said base frame adjacent said base frame front end, said front leg having an opposite front leg end extending obliquely upwardly in an unfolded position, a rear leg having a rear leg end pivotally connected to said base frame adjacent said base frame rear end and an opposite rear leg outer end, a front leg guiding sleeve pivotally connected to said rear leg adjacent said outer end and being slidable on said front leg, a handle bar having an inner end fixed on said front leg guiding sleeve, a handle bar guiding sleeve slidable on said handle bar and fixed to said opposite front leg end, detent means permitting movement of said front leg guiding sleeve in a direction toward said front leg but locking said front leg guiding sleeve in an adjusted position, and releasable latching means defined between said handle bar and said front leg preventing movement of said handle bar and said rear leg to said front leg.

4,892,328

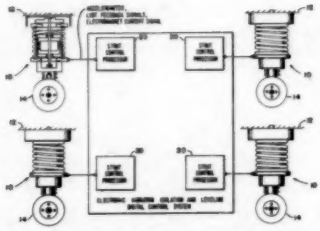
ELECTROMAGNETIC STRUT ASSEMBLY

Zvi Kurtzman, Los Angeles; Keith O. Stuart, Cypress, and Blake W. Bartosh, Manhattan Beach, all of Calif., assignors to Aura Systems, Inc., Los Angeles, Calif.

Filed May 27, 1988, Ser. No. 200,025

Int. Cl.[4] B20G 17/00

U.S. Cl. 280—707 23 Claims



1. An assembly for use in an active suspension system to couple a wheel to a chassis of a motor vehicle and for controlling the orientation of the chassis at a preselected orientation, said assembly comprising:

an electromagnetic device including the coil and a magnetically-conductive member movable within said coil along an axis of relative movement between said chassis and said

wheel, wherein said coil is adapted to move along said axis with movement of one of said chassis and wheel, and said magnetically-conductive members adapted to move along said axis with movement of the other of said chassis and wheel, said coil being adapted to generate a magnetic force on said magnetically-conductive member along said axis in response to a corrective current as a function of each of (a) any acceleration and deceleration forces applied along said axis, and (b) any difference between (i) the position of said chassis relative to said wheel and (ii) a predetermined value of the relative position between said chassis and wheel; and

control means for generating said corrective current as a function of acceleration and deceleration forces applied along said axis and the position of said chassis relative to said wheel along said axis.

4,892,329

STABILIZER CONTROL APPARATUS FOR USE IN MOTOR VEHICLES

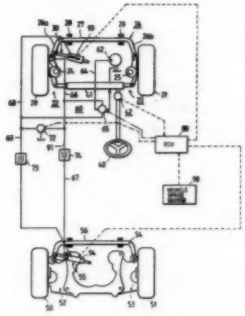
Tetsuji Kozaki; Mamoru Shimamoto, both of Nagoya, and Toshio Oonuma, Susono, all of Japan, assignors to Nippondenso Co., Ltd. and Kariya and Toyota Jidosha Kabushiki Kaisha, both of Toyota, Japan

Filed Nov. 21, 1988, Ser. No. 273,533

Claims priority, application Japan, Nov. 19, 1987, 62-292568

Int. Cl.[4] B62D *9/02*

U.S. Cl. 280—772 **5 Claims**



1. A control apparatus for use in a motor vehicle having at least a left-side wheel and a right-side wheel, comprising:

elastically twistable stabilizer means provided between said left-side and right-side wheels of said motor vehicle;

hydraulic pressure cylinder unit means coupled between one end portion of said elastically twistable stabilizer means and one of said left-side and right-side wheels, said hydraulic pressure cylinder unit means having at least one cylinder body and one piston dividing the space within said cylinder body into two chambers and slidably movable in said cylinder body so as to be expandable and contractable in accordance with slidable movements of said piston;

hydraulic pressure generator means for generating a hydraulic pressure;

hydraulic pressure actuator means including change-over valve means and coupled between said hydraulic pressure generator means and said hydraulic pressure cylinder unit means to control hydraulic pressures in said two chambers of said cylinder body using the hydraulic pressure generated by said hydraulic pressure generator means so as to allow adjusting a position of said piston, the position of said piston in said cylinder body determining the twisting amount of said stabilizer means;

steering angle sensor means for sensing a steering angle of said motor vehicle in response to a rotational movement of a steering wheel of said motor vehicle and generating a signal indicative of the sensed steering angle;

position sensor means adapted for sensing the position of said piston in said cylinder body and generating a signal indicative of the sensed piston position;

first control means responsive to said steering angle signal and said position signal from said steering angle sensor means and said position sensor means to determine a predetermined stable condition of said motor vehicle on the basis of said steering angle signal and to obtain a neutral position of said piston taken under the condition that said motor vehicle is in said predetermined stable condition, said neutral position thereof being sensed by said position sensor means; and

second control means responsive to said steering angle signal to determine a turning state of said motor vehicle on the basis of said steering angle signal and to determine a target piston position with respect to the obtained neutral position of said piston in accordance with the degree of the vehicle turning state, determined by said steering angle signal, in response to the determination of the vehicle turning state, said second control means outputting a control signal to said hydraulic pressure actuator means so that said piston is controlled to assume the determined target piston position.

4,892,330

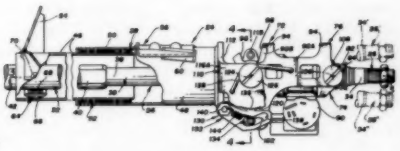
ADJUSTABLE STEERING COLUMN

Howard D. Beauch, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1988, Ser. No. 285,693

Int. Cl.[4] B62D *1/18*

U.S. Cl. 280—775 **5 Claims**



1. An adjustable steering column comprising:

a tubular mast jacket having a lower end and an upper end each adapted for attachment to a vehicle body,

a steering shaft disposed in said mast jacket with an upper end projecting beyond said mast jacket upper end,

a lower mount supporting said steering shaft on said mast jacket near said lower end thereof for rotation and for tilting in a vertical center plane of said mast jacket about a point near said lower end thereof between an upper limit position and a lower limit position,

an upper mount supporting said steering shaft on said mast jacket near said upper end thereof for rotation and for said tilting movement in the vertical center plane of said mast jacket, and

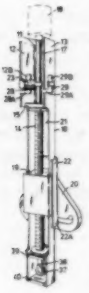
a tilt lock between said upper mount and said mast jacket operative to releasably lock said steering shaft in a plurality of positions between said upper limit position and said lower limit position.

4,892,331

MOTORIZED HEIGHT ADJUSTER FOR ADJUSTING THE HEIGHT OF THE PILLAR LOOP IN VEHICLE SAFETY BELTS

Erik Wollner, deceased, late of Alingsas, Sweden (by Barbro Wollner, representative); Barbro Wollner, and Leif Ensrdal, both of Alingsas, Sweden, assignors to Allied Engineering Company S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 71,518, Jul. 9, 1987, abandoned. This application Feb. 1, 1988, Ser. No. 151,114
Claims priority, application Sweden, Jul. 10, 1986, 8603077
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 **10 Claims**



1. Motorized height adjuster for adjusting the height of the pillar loop in vehicle safety belts, comprising;

an elongate bar having a substantially U-shaped cross-section;

a threaded spindle rotatably mounted in the bar;

a motor positioned adjacent a first end of said bar and connected to a first end of said spindle for driving the spindle;

a carrier for the pillar loop adapted to be moved along the bar by the rotation of the spindle, and

first screw means for attaching said first end of said bar to said vehicle body and second screw for attaching a second end of said bar to the vehicle body, wherein

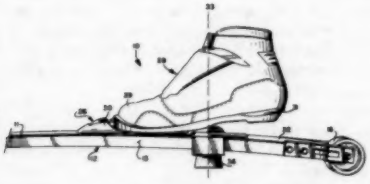
the first screw means has a main portion configured for engagement with the bar between said motor and a second end of said spindle, and configured for positioning between the sidewalls of said bar, said main portion provided with a recess for unobstructed accommodation of said spindle.

4,892,332

BRAKING SYSTEM FOR ROLLER SKIS

Ryan Jennings, 1 Apple La., Glen Falls, N.Y. 12801

Filed Nov. 4, 1988, Ser. No. 267,448
Int. Cl.[4] A63C *17/04*
U.S. Cl. 280—842 **14 Claims**



1. A roller ski assembly comprising:

(a) a ski having an elongated body having substantially flat top and bottom surfaces, an inside side edge, and an outside side edge, and front and rear ends;

(b) means for mounting a piece of footwear on the top surface of said ski body at a location thereon closer to said rear end than said front end;

(c) roller means disposed at said rear end and said front end of said ski body for mounting said ski body for rolling movement along a traversable surface;

(d) at least one friction producing braking element for effecting braking of the rolling movement of said ski body when said element is brought into engagement with a traversable surface, said element being generally circular in cross-section; and

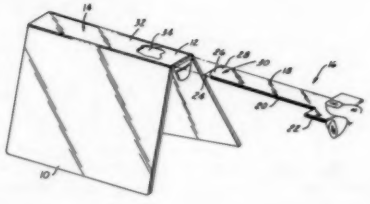
(e) means for mounting said braking element to said ski body so that the operative portion of said braking element is disposed beneath said ski body, and the center of said generally circular cross section braking element is substantially disposed in a vertical plane containing said inside edge of said ski so that a substantial portion of said element extends horizontally away from said ski past said plane containing said inside edge of said ski body, but is unconnected to any other structure, and so that said braking element is out of contact with a traversable surface when said top surface of said ski body is substantially horizontal; and wherein the center of said braking element is substantially disposed in a vertical plane that extends approximately through the center of the footwear in a dimension perpendicular to the direction of elongation of said ski body.

4,892,333

WINDOW POCKET INSERTION DEVICE AND METHOD OF USE THEREFOR

Ronald F. Krulich, 8945 Mystic La., Warren, Mich. 48093

Filed Jun. 4, 1987, Ser. No. 58,262
Int. Cl.[4] B42D *3/00*; B42F *13/00*; B25B *9/00*; A41H *43/00*
U.S. Cl. 281—15.1 **2 Claims**



1. A device for inserting and removing sheet material with respect to a pocket, said pocket being defined by an outer overlay surface and an inner surface, said device comprising:

pair of prongs, each prong of said pair of prongs having a mutually similar length, width and thickness, each said prong being oriented in mutual parallel relationship, each said prong having a thin thickness as compared with said width, said length and said width of each said prong forming a substantially rectangular shape which defines a first face and an opposite second face, each first face of said pair of prongs being in mutual adjacency, each of said prongs further being flexibly joined at one end so as to permit the sheet material to be placed between each said first face of said pair of prongs, each said prong of said pair of prongs being dimensioned so that said pair of prongs and the sheet material may be both inserted into the pocket and removed from the pocket with only an extreme end portion of the sheet material contacting the pocket, said pair of prongs being structured to guide the sheet material into a seating position in the pocket when said pair of prongs is moved inward relative to the pocket, said pair of prongs being structured to frictionally interact

with the sheet material so as to remove the sheet material from said seating position in the pocket when said pair of prongs is moved outward relative to the pocket except when the outer overlay surface of the pocket is pressed against said extreme end portion of the sheet material thereby trapping the sheet material between the outer overlay surface of the pocket and the inner surface of the pocket.

4,892,334

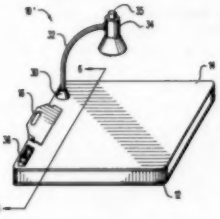
PORTABLE CLIPBOARD AND STORAGE BOX

Gary A. Sinclair, 22617 120th Ave. SE., Kent, Wash. 98031

Filed Mar. 9, 1989, Ser. No. 321,002

Int. Cl.[4] B42D *3/00*

U.S. Cl. 281—45 **1 Claim**



1. A portable clipboard and storage box, comprising:
a shallow generally rectangular box;
a cover mounted by a hinge on said box;
a spring retainer clip adjacent an upper edge of said cover;
cooperating magnetic fastening means adjacent an interior bottom edge of said cover and on a bottom edge of said box;
said magnetic fastening means comprises a rectangular magnet sandwiched between a pair of steel side plates and disposed within a bottom sidewall of said box, each of said steel side plates having an inwardly extending peg received through a transverse aperture formed through a midportion of said magnet;
a pair of spaced notches in said bottom edge of said box for opening said cover;
a light mounted by a flexible stem on said cover and operatively connected to a battery power source within said box; and
a digital clock on said cover.

4,892,335

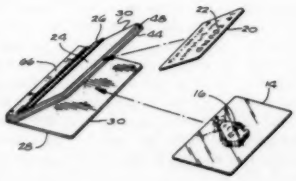
CARD CONSTRUCTION

Milton C. Taft, Whittier, Calif., assignor to Rand McNally & Company, Skokie, Ill.

Filed Nov. 14, 1986, Ser. No. 931,364

Int. Cl.[4] B42D *15/00*; **G09F** *19/00, 3/00*; **B41L** *37/08*

U.S. Cl. 283—75 **16 Claims**



1. A card construction for carrying information, comprising:
first and second protective coverings, each capable of transmitting information through said covering;
structure between said protective coverings defining first and second openings positioned to communicate with one another in the direction of the thickness of the card construction, said first opening disposed toward said first protective covering and said second opening disposed toward said second protective covering, said openings having boundaries, along a boundary of the card construction, which are out of registration with one another; and
a first information-carrying medium in said first opening having a front face and a back face, said front face of said first information-carrying medium carrying information and facing said first protective covering, and a second information-carrying medium in said second opening having a front face and a back face, said front face of said second information-carrying medium carrying information and facing said second protective covering, said mediums being positioned in said openings to abut each other along said back faces.

4,892,336

ANTIFALSIFICATION DOCUMENT HAVING A SECURITY THREAD EMBEDDED THEREIN AND A METHOD FOR PRODUCING THE SAME

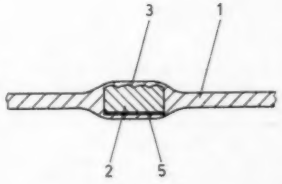
Wittich Kaule, Emmering; Jurgen Moll, Grunwald; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fuer Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Mar. 18, 1987, Ser. No. 27,552

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609090

Int. Cl.[4] B42D *15/00*; **G09F** *3/00*; **G02B** *5/18, 1/10*

U.S. Cl. 283—91 **22 Claims**



1. An antifalsification document comprising a security thread embedded within the document, wherein said security thread is made of a transparent material;
a first side of said security thread exhibits a printed pattern;
a second side of said security thread spaced away from said printed pattern, defining an outer surface area of said security thread, exhibits an optically effective structure wherein when said printed pattern is viewed through said optically effective structure different areas of said printed pattern are recognizable at different viewing angles, and
wherein said printed pattern is configured so that an optical appearance of said security thread changes when viewing angle changes.

4,892,337

FATIGUE-RESISTANT THREADED CONNECTOR

Richard H. Gunderson, Houston, Tex.; Jerome Q. Burns, San Diego, Calif., and Stewart A. Fox, Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jun. 16, 1988, Ser. No. 207,687

Int. Cl.[4] F16L *15/00*

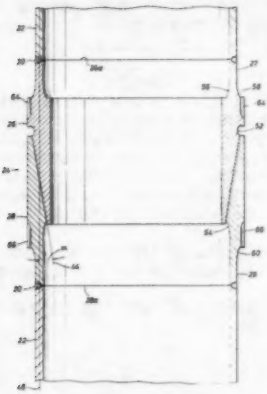
U.S. Cl. 285—333 **18 Claims**

1. A threaded connector for use in connecting adjacent sections of tubing in a tubing string, said tubing having an inside diameter, an outside diameter, and a wall thickness, said

tubing string having a longitudinal axis, said threaded connector comprising:

(a) a generally tubular pin member having first and second ends, said first end of said pin member adapted to be welded to a first section of said tubing, at least a portion of said pin member having a generally frustoconical outer surface which tapers radially inwardly toward said second end of said pin member, said frustoconical outer surface having a thread formed thereon;

(b) a generally tubular box member having first and second ends, said first end of said box member adapted to be welded to a second section of said tubing, at least a portion of said box member having a generally frustoconical inner surface which tapers radially outwardly toward said second end of said box member, said frustoconical inner



surface having a thread formed thereon which corresponds to and is threadedly engagable with said thread formed on said pin member;

(c) said thread formed on said pin member and said thread formed on said box member being modified buttress threads having a load flank substantially perpendicular to said longitudinal axis of said tubing string;

(d) said threaded connector adapted to be radially preloaded upon assembly and having a tapered thread engagement oriented so that the midpoint of said tapered thread engagement is located at approximately the same radial distance from said longitudinal axis of said tubing string as the midpoint of said wall thickness of said tubing, whereby there is a substantially straight load path with substantially no eccentricity through said threaded connector.

4,892,338

PLURAL POINT DOOR LOCK AND FLUSH-MOUNTABLE OPERATING MECHANISM WITH DETENT

Lee S. Weinerman, Medina; Joseph P. Spinelli, Jr., Seville, and Michael J. Rachocki, Columbia Station, all of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Oct. 13, 1988, Ser. No. 257,837

Int. Cl.[4] E05C 1/12

U.S. Cl. 292—35 **20 Claims**

1. A plural-point latch for mounting on a closure for releasably retaining the closure in a closed position, comprising:

(a) a plurality of latch bolt assembly means for attachment to a closure at a plurality of spaced locations about the periphery of the closure for releasably engaging suitably configured strike formations that are provided adjacent the spaced locations, with each of the latch bolt assembly means including casing means for attachment to the closure, and an associated latch bolt means that is connected to the casing means for movement relative to the casing means into and out of engagement with an associated one of the strike formations;

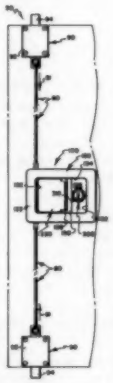
(b) flush-mountable operating means for flush-mounting on the closure at an operating means location that is remote from each of the plurality of spaced locations;

(c) elongate linkage means for connecting the operating means with the latch bolt assembly means for moving the latch bolt means out of engagement with their associated strike formations in response to operation of the operating means so as to release the latch bolt assembly means from engagement with the strike formations;

(d) wherein the operating means includes:

(i) pan-shaped housing means formed as a metal stamping and having side and back walls that define a forwardly-facing recess that is surrounded by a perimetrically extending mounting flange, with the back wall having a front surface that faces forwardly into the recess, and having a back surface on the opposite side thereof, and with the back wall having an opening that is formed through the back wall;

(ii) mounting plate means formed as a metal stamping for attachment to the back surface of the back wall in the vicinity of the opening that is formed through the back



wall, with the mounting plate means having opposed side formation means and opposed end formation means that form a continuous band of material that extends about a central opening that is formed through the mounting plate means, with the opposed side formation means having at least portions thereof that are configured to extend along portions of the back wall that are located on opposite sides of the opening that is formed through the back wall, and with the mounting plate means having track formation means that extend from the opposed side formation means toward the central opening to define a pair of opposed rail means that face toward each other and extend along opposite sides of the central opening, with the opposed rail means extending substantially parallel to each other and being spaced apart by a first distance for defining a slide track that extends along the back wall in the vicinity of the opening that is formed through the back wall, and with the track intersecting with the opening that is formed through the back wall;

(iii) elongate slide means having a pair of opposed, longitudinally extending side portions that face away from each other and are spaced apart by a second distance that is greater than the first distance, with groove means being provided to extend longitudinally along the side

portions to define a pair of grooves that are configured to receive the opposed rail means to mount the slide means for movement along the track;

(iv) handle means pivotally mounted on the housing means and being movable with respect to the housing means between a nested position wherein the handle means is nested within the recess, and an extended position wherein at least a portion of the handle means projects forwardly from the recess, with the handle means having a rearwardly extending projection that extends through the opening that is formed through the back wall and that extends into the slide means moves along the track;

(v) receiving formation means provided on the slide means for closely receiving the rearwardly extending projection of the handled means to provide an essentially play-free driving connection between the handle means and the slide means that is operable to cause the handle means and the slide means to move in unison, with the slide means being movable along the track between a first position that is assumed by the slide means when the handle means is in its nested position, and a second position that is assumed by the slide means when the handle means is in its extended position;

(vi) operating arm means for connecting the elongate linkage means to the slide means to effect movement of the elongate linkage means in response to movement of the slide means such that, when the slide means is in its first position, the elongate linkage means permits the latch bolt means to extend into engagement with the strike formations, and when the slide means is in its second position, the elongate linkage means retracts the latch bolt means from engagement with the strike formations, with the operating means including a pair of operating arms each of which is connected to the housing means for pivotal movement relative to the housing means about a separate axis of rotation, and each of which is connected to the slide means so as to be rotated about its associated axis of rotation in response to movement of the slide means between its first and second positions; and,

(vii) detent means interposed between the slide means and the housing means, for releasably retaining the slide means in its first and second positions with respect to the housing means, with the detent means including a hole formed in the slide means and opening forwardly toward the back wall of the housing means, a detent element positioned in the hole, biasing means positioned in the hole for biasing the detent element forwardly with respect to the hole so as to project outwardly from the hole and into engagement with the back wall portion of the housing means, and with first and second dimple-like depression means being provided in the back wall portion of the housing means for receiving the detent element when the slide means is in its first and second positions.

4,892,339

POWER-CLOSING MOTOR-VEHICLE DOOR LATCH

Frank Kleefeldt, Heiligenhaus, and Hans T. Menke, Velbert, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 218,238

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725075

Int. Cl.[4] E05C *3/26*; E05B *47/00*

U.S. Cl. 292—201 **5 Claims**

1. A vehicle door latch in combination with a door belt, the latch comprising:

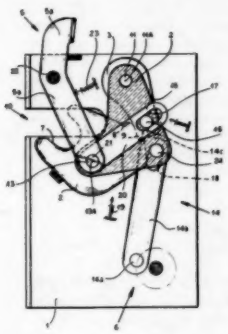
a door belt;

a housing formed with a horizontally open recess in which the bolt is receivable;

a latch fork formed with a fork seat and with at least one detent;

a fork pivot on the housing supporting the fork for pivoting between a locked and a semilocked position with the seat directly vertically away from the fork pivot and the bolt engaged in the seat and an unlocked position permitting the bolt to enter and exit seat and recess;

an operating plate pivotal on the housing about an operating plate axis substantially parallel to the fork pivot;



a latch pawl pivotal on the operating plate into and out of a position engaging the detentand thereby retaining the fork in the semilocked position;

means including a motor connected to the operating plate for pivoting same means about its axis and, when the pawl is engaged with the detent, pivoting the fork into the locked position; and

a door handle and a link connected between the handle and the pawl for pivoting same out of engagement with the detent in any position of the fork.

4,892,340

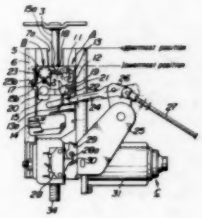
ELECTRIC LOCKING DEVICE FOR LID

Masaharu Matumoto, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Oct. 13, 1987, Ser. No. 106,680

Int. Cl.[4] E05B *65/19*

U.S. Cl. 292—201 **17 Claims**



1. An electric locking device for locking a lid to a receptacle member, comprising:

a striker mounted to said lid;

a lock proper mounted to said receptacle member and locking said striker when the striker is brought into full engagement therewith, said lock proper being movable relative to said receptacle member along a guide path;

a locked condition sensing means mounted to said receptacle member, said sensing means issuing a striker locked condition representing signal when said striker is locked by said

lock proper and issuing a striker released condition representing signal when said striker is released from said lock proper;

an electric mover mounted to said receptacle member for moving, when electrically energized, said lock proper along said given way;

a control circuit for controlling operation of said electric mover in such a manner that when said sensing means issues said striker locked condition representing signal, the mover moves said lock proper in one direction along said guide path to a first position for achieving full closing of said lid and when said sensing means issues said striker released condition representing signal, the mover moves said lock proper in a second direction along said guide path to a second position for catching said striker; and

a hollow slider to which said lock proper is installed, and a guide frame to which said slider is slidably connected, said guide frame being secured to said receptacle member;

wherein said lock proper comprises:

a latch plate rotatably held in said slider;

a pawl plate rotatably held in said slider, said pawl locking said latch plate when the latter latches said striker;

an open lever rotatable together with said pawl plate;

a lock cancelling lever pivotally connected at one end to said slider;

a connecting lever connecting said lock cancelling lever to said open lever in a lost motion manner, so that pivoting said lock cancelling lever in a given direction can induce a pivoting of said open lever in a first direction causing said pawl plate to release the latch plate; and

actuating means for pivoting said lock cancelling lever in said given direction when said lock proper is moved in said second direction.

4,892,341

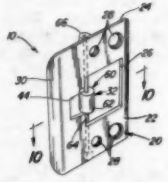
SELF-ADJUSTING DOOR STRIKE

Hagen Dietrich, Delta, Canada, assignor to Masco Building Products, Corp., Taylor, Mich.

Division of Ser. No. 9,434, Feb. 2, 1987, Pat. No. 4,813,724. This application Aug. 19, 1988, Ser. No. 234,431

Int. Cl.[4] E05B *15/02*

U.S. Cl. 292—341.12 **4 Claims**



1. A door strike adapted to receive a latch bolt of a door lock mechanism, the latch bolt extending longitudinally from the door lock mechanism through said door strike into a door frame to which said door strike is mounted, said door strike comprising:

a plate member having rear and front faces and a plurality of apertures for mounting said plate member to the door frame in alignment with the door lock mechanism, said plate member including a central opening having a configuration substantially similar to the configuration of the latch bolt longitudinally extendable through said central opening; and

a resilient biasing member attached to said plate member, said resilient biasing member including at least one roller axially mounted to a flexible spring-wire having its outer ends secured to the rear face of said plate member, said at least one roller extending across at least a portion of said central opening to laterally engage and bias against the latch bolt upon extension of the belt through said central opening wherein said plate member includes a guide notch communicating with said central opening, said notch guiding the biasing movement of said roller upon extension of the latch bolt through said central opening of said plate member.

4,892,342

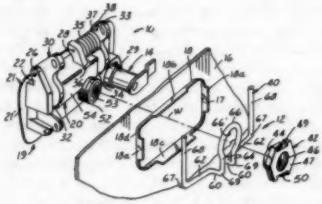
VEHICLE DOOR HANDLE MOUNTING ARRANGEMENT

Howard G. Newman, Troy; David G. Monette, Warren; Michael D. Koczara, St. Clair Shores; Duane J. Ribant, Fraser; Ronald D. Papke, Rochester; Alfred A. Bien, West Bloomfield, and Richard A. Hawkins, Livonia, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 13, 1989, Ser. No. 296,636

Int. Cl.[4] E05C *21/00*

U.S. Cl. 292—347 **8 Claims**



1. In a housing mounted on a vehicle body panel, said housing comprising a main portion extending inboard through a rectangular-shaped panel opening and having a terminal lip flange portion extending around the periphery of said housing main portion in flush engagement with the outboard surface of said panel, the panel opening symmetrical axis extending transversely through the geometric center thereof, said panel opening formed with inboard extending border side and bottom flange means, an improved arrangement for securing said housing in said panel opening comprising:

said housing main portion formed with an inboard extending cylindrical-shaped externally threaded hub having its principal axis substantially aligned on said opening symmetrical axis;

a piloted nut comprising a driving head portion and an internally threaded pilot collar portion extending from one undersurface of said head portion, said collar portion extending axially from said undersurface with its internal threads engaging said hub external thread;

a bent spring rod retainer interposed between the inboard surface of said panel and said nut driving head undersurface, said spring rod retainer in its free state comprising an inboard upstanding central open eye formation defining a semi-circular eyelet and a pair of outboard upstanding arm portions;

said bent spring rod retainer having a pair of angled rod-length portions lying in a horizontally disposed base plane, a pair of upstanding transition portions, each said transition portion joining an associated one end of said open eye formation with a respective inboard end of an associated angled rod-length base portion, and each said upstanding arm portion joined to the outboard end of an associated angled rod-length base portion;

each said spring retainer arm portion juxtaposed on the outwardly facing surface of an associated one of said border side flange means and each said angled rod-length base portion juxtaposed on the downwardly facing surface of said border bottom flange means, such that the center of said retainer eyelet is self-aligned on said panel rectangular opening symmetrical axis;

said eye formation semi-circular eyelet having a predetermined diameter slightly greater than said piloted nut col-

lar for passage of said collar within said eyelet with no play upon said collar internal thread being threaded-on said hub external thread; and

whereby upon said nut being turned in a threading-on direction pressure is brought to bear on said open eye formation and said arm portions causing said spring retainer to be axially flexed wherein said retainer provides a constant spring biasing preload acting on said nut driving head undersurface and said panel inboard surface locking said nut against loosening while said arrangement secures said housing in said panel opening.

4,892,343

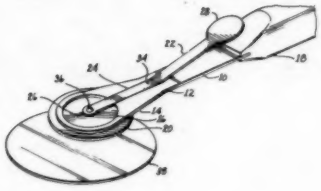
VACUUM PENCIL

Brian E. Hall, 3046 E. Dover St., Mesa, Ariz. 85213

Filed Oct. 5, 1988, Ser. No. 253,689

Int. Cl.[4] B66C *1/02*; B25J *15/06*

U.S. Cl. 294—64.1 **24 Claims**



1. A vacuum pencil for transporting semiconductor members, comprising:

a. a relatively flat, planar frame member having an enlarged end with a substantially circular hole formed therein;

b. a handle coupled to an end of the frame member opposite the enlarged end thereof;

c. a relatively flat, deformable elastic member having a first upper side for engaging the enlarged end of the frame member and an opposing lower side for engaging a semiconductor member, the upper side of the deformable elastic member being disposed adjacent and connected to the enlarged end of the flat frame member and concentric with the hole formed therein, the deformable elastic member having a central portion;

d. a lever member having a relatively flat first end lying closely adjacent to the flat frame member, the flat first end being connected to the central portion of the deformable elastic member, the lever member including an opposing second end adapted to be depressed by the user, thereby causing the flat first end to raise the central portion of the deformable elastic member to create a temporary vacuum attachment when the deformable elastic member is in contact with a semiconductor member, thereby permitting the semiconductor member to be safely lifted and transported.

4,892,344

PARALLEL GRIPPER

Susumu Takada, and Kouichirou Ishibashi, both of Soka, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,422

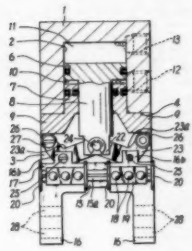
Claims priority, application Japan, May 25, 1987, 62-078398

Int. Cl.[4] B25J *15/08*

U.S. Cl. 294—88 **8 Claims**

1. A parallel gripper which opens and closes a pair of fingers while keeping parallelism between said fingers by transmitting driving force of a fluid pressure actuator to the fingers by means of a power transmission mechanism, which comprises:

the fluid pressure actuator is constructed by arranging a pair of pistons in a single cylinder bore provided in a body, the pair of pistons having the same diameter and being mutually slidable in the cylinder bore, one of the pistons which is an outer piston having a center hole and guide sections on both sides of the center hole, the other piston which is an inner piston being provided with a rod which passes slidably and hermetically through the center hole,



wherein a pressure chamber is defined between the pistons,

the pair of fingers are supported slidably in a direction perpendicular to the axial direction of the cylinder bore by means of guide members provided on the body,

the power transmission mechanism consists of a pair of levers, in which one end of each lever is pivotally connected on the rod of the inner piston such that said one end of each lever moves with said inner piston, the other end of each lever being in contact with each guide section of the outer piston, and a bent portion at the middle of each lever is mounted pivotally on each finger such that the two fingers move relatively in parallel, so that the opening and closing operation for gripping with the fingers is realized by driving of both pistons and

a port for supplying and discharging a pressurized fluid into the pressure chamber between the pair of pistons to open and close the fingers for gripping a work.

4,892,345

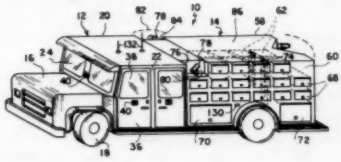
ARMORED VEHICLE

Stephen Rachael, III, 6329 Briergate, Bartlett, Tenn. 38134

Filed Sep. 23, 1988, Ser. No. 248,195

Int. Cl.[4] B60P *3/03*

U.S. Cl. 296—24.1 **5 Claims**



1. An armored vehicle comprising;

a body including a forward cab section and an rearward vault section,

said vault section provided with left and right side walls having a plurality of cargo compartments therebetween each having a separate door juxtaposed a respective one said side wall,

actuating means for unlocking and permitting opening of said compartment doors whereby access may be had to said cargo compartments,

said cab section includes opposite sides each provided with at least one door permitting passage of crew members,

said vault section side walls disposed in planes inwardly offset from the plane of said cab section sides,

control means operable from within said cab section to

activate said actuating means,

video cameras on said body having a field of view encompassing said compartment doors,

at least two said video cameras respectively disposed on said vault section adjacent the juncture between said cab and vault sections and disposed in defined spaces recessed from said vault section side walls, and

video monitor means within said cab section displaying the images captured by said video cameras.

4,892,346

DROP-IN UTILITY ENCLOSURE APPARATUS

Joseph P. Berlin, 198 Plank Rd, Clifton Park, N.Y. 12065

Filed Feb. 16, 1989, Ser. No. 310,913

Int. Cl.[4] B60R *11/00*

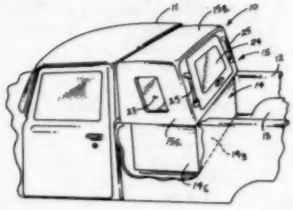
U.S. Cl. 296—37.6 **12 Claims**

1. A drop-in utility enclosure apparatus removably mountable into the forwardmost portion of a flat truck body including vertical walls extending upwardly from the truck body wherein said apparatus comprises,

a lower unit defined by a lower rear face, a lower forward face, a lower first side, a lower second side, and a lower bottom face, and

an upper unit integrally formed to and extending upwardly of said lower unit defined by an upper rear face, an upper top face, an upper first side, an upper second side, and an upper forward face aligned with said lower forward face and wherein said upper first and second sides extend outwardly of said lower first and second sides to define first and second surfaces to overlie the walls of the truck body, and

wherein said lower rear and forward faces are of a length substantially equal to that of the interior width of the



truck bed and of a height substantially equal to that of the walls of the truck bed, and the length of the forward and rear faces of the upper unit are defined by the lengths greater than that of the lower forward and rear faces to overlie the walls of the truck bed, and

wherein said upper rear face includes a pivotally mounted door enabling access interiorly of the upper and lower units, and

wherein first and second lids are pivotally mounted overlying the first and second surfaces interiorly thereof in the upper unit to completely overlie the lower unit interiorly thereof when the first and second lids are in a lowered position.

4,892,347

APPARATUS FOR SAVING AND PROTECTING THE SHOES OF THE DRIVER OF A MOTOR VEHICLE

Helmut Steinhilber, Sonnenbergstr. 40, CH-6052 Hergiswil Schweiz, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 202,189

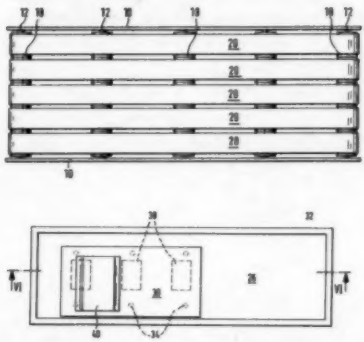
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1987, 3718581

Int. Cl.[4] B60N *3/06*

U.S. Cl. 296—75 **21 Claims**

1. An apparatus for saving and protecting the shoes of a driver of a motor vehicle, comprising: a support device for resting the foot of a driver, said support device being disposed in front of the gas pedal and the braking pedal of a motor vehicle and being movable with the foot at least in a cross direction, and said support device comprising at least one belt (20).

9. An apparatus for saying and protecting the shoes of a driver of a motor vehicle having a floor, comprising; a support device for resting the foot of the driver, said support device being disposed in front of the gas pedal and braking pedal of a motor vehicle and being movable with the driver's foot at least in a cross direction, and said support device comprising a plate (30) slidably supported on a base plate (26), said base plate position on said floor (16); whereby no friction occurs between



the plate and the driver's shoe during sideways movement of the driver's foot.

4,892,348

CONSTRUCTION OF LOWER PART OF DOOR IN MOTOR VEHICLE

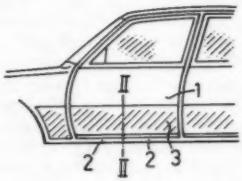
Masahiro Nozaki, Ama, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 1, 1989, Ser. No. 304,658

Claims priority, application Japan, Mar. 24, 1988, 63-38600; Mar. 31, 1988, 63-43868; Sep. 26, 1988, 63-125818

Int. Cl.[4] B62D *27/00*

U.S. Cl. 296—146 **6 Claims**



1. A construction of a lower part of a door of a motor vehicle, comprising:

a broad moulding-shaped cover plate attached to an outer surface of a lower portion of a door outer panel so as to cover the lower portion thereof; and

a seal member attached along a lower edge of said cover plate for sealing a space between a lower edge of said cover plate and a rocker panel; said seal member being formed of an elastic material, and provided with a base portion retained by said lower edge of said cover plate in pressure contact with the outer surface of the door outer panel, which is opposed to said lower edge of said cover plate, and a sealing portion which extends downward

from said base portion like a lip and of which a lower end is brought into contact with said rocker panel when the door is closed.

4,892,349

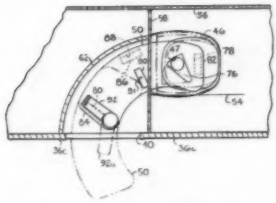
TOILET SYSTEM WITH REMOVABLE HOLDING TANK FOR RECREATIONAL VEHICLES

Charles L. Sargent, Ann Arbor, Mich., assignor to Thetford Corporation, Ann Arbor, Mich.

Filed May 13, 1988, Ser. No. 193,905

Int. Cl.[4] B60R *15/04*

U.S. Cl. 296—156 **13 Claims**



8. A waste holding tank for use with a water use sanitary toilet in a recreational vehicle, said tank separably connected to said toilet to form a fluid connection therebetween to allow waste from said toilet to pass into said tank, said tank comprising

a generally horizontal bottom wall;

a generally horizontal top wall vertically spaced above said bottom wall;

first and second upright end walls disposed between said top and bottom wall; and

first and second curved upright sidewalls disposed between said bottom and top walls joining said top and bottom walls along longitudinal edges of said top and bottom walls, said sidewalls being curved in arcuate paths about a common center point.

4,892,350

AUTOMOBILE UNDERBODY STRUCTURE

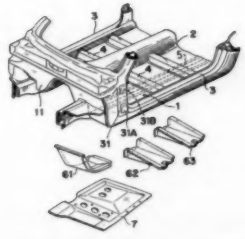
Mitsutoshi Kijima, Iwakuni, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 2, 1988, Ser. No. 227,249

Claims priority, application Japan, Aug. 4, 1987, 62-119372[U]

Int. Cl.[4] B62D *27/02*

U.S. Cl. 296—204 **6 Claims**



1. An automobile underbody structure comprising:

a floor panel having a pair of longitudinal side edges, each said side edge extending in a direction to be longitudinally of an automobile body structure;

a pair of side sills, each said side sill being rigidly secured to a respective said side edge so as to extend in a direction generally parallel to the longitudinal dimension of the automobile body structure;

a pair of side frames positioned between said side sills and secured from below to an undersurface of said floor panel so as to extend generally parallel to said side sills;

two sets of a plurality of generally elongated torque boxes, one said set for each side of said floor panel, said torque boxes of each said set being secured to said undersurface of said floor panel so as to define generally closed hollow spaces in cooperation with said floor panel, said torque boxes of each said set being spaced apart from each other in a direction longitudinally of the automobile body structure; and

a reinforcement plate member secured to said torque boxes of each said set and spaced from said floor panel.

4,892,351

WATER DRAIN TROUGH FOR AUTOMOTIVE SUNROOF

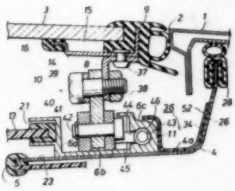
Jun Ono; Yuichiro Iso, and Hiroshi Ise, all of Saitama, Japan, assignors to Honda Giken Kogyo K.K., Japan

Filed Feb. 23, 1988, Ser. No. 159,082

Claims priority, application Japan, Mar. 13, 1987, 62-058081; Jun. 9, 1987, 62-143638

Int. Cl.[4] B60J *7/195*; B60R *13/07*

U.S. Cl. 296—213 **10 Claims**



1. In combination, a sunroof structure having an opening provided in a roof panel of an automobile, a sunroof panel which can move between a first position for closing the opening and a second position for exposing the opening, a sunroof base panel supporting a pair of guide rails extending longitudinally of said automobile roof panel along a side periphery of said opening and for achieving the motion of the sunroof panel, and a water drain trough defined along a peripheral region of the opening, wherein the water drain trough comprises a trough liner having a substantially U-shaped cross section extending along a peripheral region of the opening and resting upon an inner surface of a substantially upright outer wall of the sunroof base panel and an outer surface of said guide rails for the sunroof panel.

4,892,352

SEAT

Michael Haywood, Hillside, Bushcombe Lane, Woodmancote, Cheltenham GL 52 4QL, England

Filed Nov. 1, 1988, Ser. No. 265,542

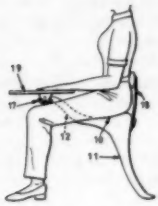
Claims priority, application United Kingdom, Nov. 4, 1987, 8725782

Int. Cl.[4] A47B *39/00*

U.S. Cl. 297—195 **7 Claims**

1. A seat comprising a seating member, ground engageable support means depending from the seating member, the support means alone being incapable of maintaining the seating member in a stable seating position, and stabilizing means projecting forwards of the seating member and including, at a

position removed from the seating member, thigh abutment means for making contact with the front of a seated user's



thigh, the seat being stackable with like seats for ease of storage.

4,892,353

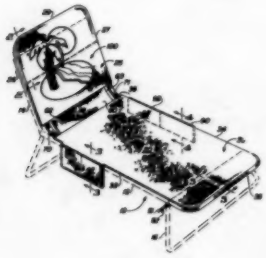
COVER FOR LOUNGE CHAIR

Dan J. Goddard, 5407 W. Roanoke Ave., Phoenix, Ariz. 85035

Filed Mar. 6, 1989, Ser. No. 319,329

Int. Cl.[4] A47C *31/00*

U.S. Cl. 297—224 **7 Claims**



1. A fitted cover for a leg-supported lounge chair of the type having a body-supporting section with a head end, foot end and opposite side edges, said cover comprising:

(a) a cover panel having a top edge, a body edge, and opposite side edges, said cover generally conforming to the shape of the lounge chair body-supporting surface;

(b) a fitting pocket extending transversely of said cover panel at the top and bottom edges thereof and engageable with at least a part of the foot and head end of the chair to maintain the cover in position on said body-supporting section;

(c) an elasticized panel extending transversely of said cover panel at an intermediate location between said fitting pockets to apply tension to said cover panel to maintain the same snugly on said chair, said elasticized panel terminating inwardly of said panel side edges; and

(d) elastic bands extending on said cover panel adjacent said elasticized panel at the side edges of said cover panel.

4,892,354

CHAIR SEAT TILT CONTROL

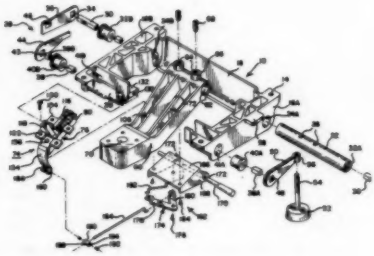
Michael H. Estkowski; Don E. Minor, Coloma, both of Mich., and Leonard V. Lastuck, Granger, Ind., assignors to Shepherd Products U.S., Inc., St. Joseph, Mich.

Filed Jun. 30, 1989, Ser. No. 374,269

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—301 **6 Claims**

1. A support mechanism for a tiltable chair including a seat support assembly having a front and a rear adapted to be mounted to the underside of a chair seat, said support assembly including a pair of side plates; a tube having a central axis supported between and toward the front ends of said side plates such that said support assembly and said tube are relatively rotatable; a rear tilt torque mechanism associated with said seat support assembly operative to resist rear tilt of said seat support assembly about said tube; a rear tilt torque adjustment means connected to said rear tilt torque mechanism to selectively vary the resistance to rear tilt; a base member having a rear end which is adapted to be supported by a chair post and a front end which is rigidly securable to said tube; a detent mechanism connected between said base member and said



support assembly to bias said support assembly to a horizontal position and to provide added resistance to rear tilt, said detent mechanism adapted to assume a first position such that rear tilt of said support assembly about said tube is permitted, but front tilt of said support assembly about said tube is prohibited, said detent mechanism further adapted to assume a second position to allow forward tilt of said support assembly about said tube; and a release mechanism associated with said detent mechanism operative to lock said detent mechanism in said first position and to selectively release said detent mechanism to assume said second position.

4,892,355

CHAIR CONSTRUCTION

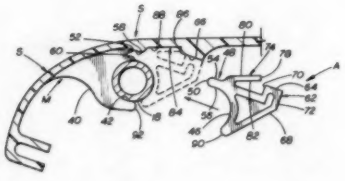
Fritz M. Fend, Regensburg, Fed. Rep. of Germany, assignor to Samsonite Furniture Company, Murfreesboro, Tenn.

Filed Nov. 18, 1986, Ser. No. 932,448

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609591

Int. Cl.[4] A47C *7/00*

U.S. Cl. 297—440 **31 Claims**



1. A chair comprising:

a frame having a forward and a rear transverse supporting member;

a seat mounted to said forward and rear transverse supporting members, said seat further comprising:

rigid rear seat attachment means,for unflexingly engaging said rear transverse supporting member to selectively secure the rear of said seat to said frame;

a front attachment member extending from said seat and adapted to engage said forward transverse supporting

member when said rear attachment means engages said rear transverse supporting member;

a clip, said clip having a rigid body, a first projection and a second, bearing surface projection, said clip adapted to engage said forward transverse supporting member whereupon said clip is retained to said forward transverse supporting member by virtue of said projections: said first projection positioned between said forward transverse supporting member and said seat and said bearing surface projection laterally spaced from said first projection and engaged with said seat at a bearing surface to provide a moment about said first projection with a force applied to said bearing surface thereby transferring load placed on said seat to said forward transverse supporting member, said clip securing said engagement between said front attachment member and said forward transverse supporting member.

4,892,356

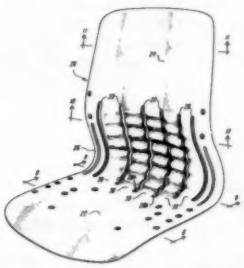
CHAIR SHELL

Ernest A. Pittman, Courtland; Edward R. Dandridge, Senatobia, both of Miss., and Robert L. Wilson, Memphis, Tenn., assignors to Chromcraft Furniture Corp., Senatobia, Miss.

Filed Jul. 27, 1988, Ser. No. 224,936

Int. Cl.[4] A47C *7/00*

U.S. Cl. 297—457 **18 Claims**



1. A chair which provides resilient flexing of the backrest and seat to accommodate occupants of different size and shape as well as movement of the occupant comprising

a one piece structurally resilient chair shell having seat and back sections joined by a generally curved transition section, said back section having a contoured portion for supporting the back,

a plurality of generally parallel slots in the shell extending rearwardly from the rear portion of the seat section across the transition section and vertically approximately half way up the back section so as to define a plurality of generally parallel ribs extending from the rear of the seat section into the back section.

a plurality of transverse corrugations formed in the ribs extending substantially throughout their length and superimposed on the contoured portion of the back section and the curved transition section,

cushioning covering the front and back of the shell and spanning the slots in the shell,

an upholstery cover enclosing the shell and cushioning and hiding the slots and corrugations,

and a base secured to and supporting the shell.

4,892,357

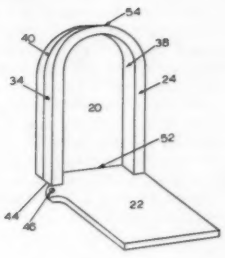
CHILD'S PORTABLE AUXILIARY SEAT CUSHION WITH UPPER BODY SUPPORT RIDGE

Adriana Nieto-Busby, and Guadalupe Nieto, both of 838 Vinemead Dr., Whittier, Calif. 90601

Filed Apr. 21, 1988, Ser. No. 184,299

Int. Cl.[4] A47C *20/00, 7/02, 31/00*

U.S. Cl. 297—464 **4 Claims**



1. A child's portable auxiliary seat cushion with upper body support ridge comprising an oblong mat of a predetermined size comprising a front layer and a back layer; interposed between said front layer and said back layer are a fiberfilled layer and an interfacing layer, both the same shape as said front layer, a continuous securing means extends around the perimeters of, and peripherally interconnects said front, fiber-filled, interfacing and back layers, stitching at the hinge defines a seat portion and backrest, said seat portion comprises: two slits, one on each side adjacent to hinge, as means for inserting a seat belt and making said seat portion pliable enough to accommodate a safety booster seat, said backrest portion comprises a ridge, upper body support means, peripherally connected to the upper outer perimeters of said backrest portion and projecting forwardly thereof, said ridge comprising an innermost, uppermost, outermost and bottom section, creating a tubular form as means for retaining a ridge filler which is made of a firm, yet resilient material such as, but not exclusive to, foam rubber.

4,892,358

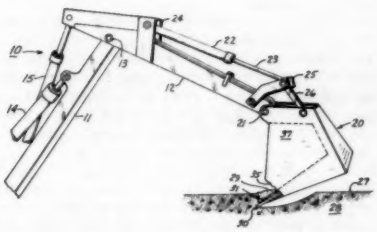
BUCKET SYSTEM WITH PERCUSSIVE PENETRATION MEMBER

Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037

Filed Jun. 10, 1988, Ser. No. 205,266

Int. Cl.[4] F02F *3/32;* F21C *3/04*

U.S. Cl. 299—37 **10 Claims**



1. A bucket system for release and collection of material on and from a working face, said system comprising:

a bucket having a bottom with a dimension of width, a digging edge, and two sides, said digging edge extending

between said sides whereby to form a material receiving structure;

an impact hammer mounted to the bucket beneath said bottom, and including a striker driven percussively and repetitively along an axis which extends generally toward said digging edge;

a penetration member mounted to the bucket beneath said bottom, aligned with said striker to receive blows from it and transmit said blows to said working face, said penetration member having a continuous free edge, extending beyond said digging edge so as to contact said working face before said digging edge makes such contact, and having a dimension of length at least equal to the distance between said two sides at the digging edge,

whereby with said impact hammer exerting percussive blow against said penetration member, and with said free edge of said penetration member pressed against said working face, the penetration member fragments said working face over a width at least equal to the distance between the said two sides, and the digging edge follows it so as to collect loosened material in said bucket.

4,892,359

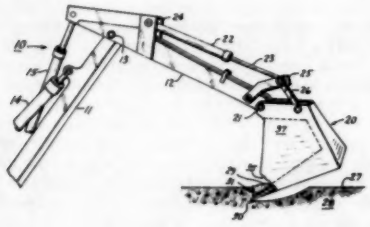
BUCKET SYSTEM WITH PERCUSSIVE PENETRATION MEMBER

Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 205,266, Jun. 10, 1988. This application May 31, 1989, Ser. No. 359,484

Int. Cl.[4] E02F *3/32*; E21C *3/04*

U.S. Cl. 299—37 **11 Claims**



1. A bucket system for release and collection of material on and from a working face, said system comprising:

a bucket having a bottom with a dimension of width, a digging edge, and two sides, said digging edge extending between said sides whereby to form a material receiving structure;

an impact hammer mounted to the bucket beneath said bottom, and including a striker driven percussively and repetitively along an axis which extends generally toward said digging edge;

a penetration member mounted to the bucket beneath said bottom, aligned with said striker to receive blows from it and transmit said blows to said working face, said penetration member having a continuous free edge, extending beyond said digging edge so as to contact said working face before said digging edge makes such contact, and having a dimension of length at least equal to the distance between said two sides at the digging edge,

whereby with said impact hammer exerting percussive blows against said penetration member, and with said free edged of said penetration member pressed against said working face, the penetration member fragments said working face over a width at least equal to the distance between the said two sides, and the digging edge follows it so as to collect loosened material in said bucket;

said penetration member including a pair of deflector wings which rise to a level above the bottom of the bucket, and which are spaced farther apart than the sides of the bucket, said wings having a free edge continuous with the free edge in front of the bottom of the bucket.

4,892,360

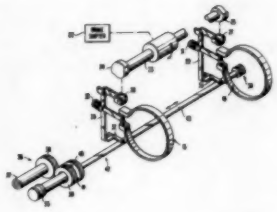
BRAKE ACTIVATION APPARATUS AND POWER DRIVE UNIT THEREFOR

John D. Tysver, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 14, 1988, Ser. No. 218,869

Int. Cl.[4] B60T *13/00*

U.S. Cl. 303—9.61 **12 Claims**



1. An activation apparatus comprising first and second brake devices capable of being selectively applied, shifting means for selectively applying either said first or second brake device and not the other, and means for overriding said shifting means for applying both of said first and second brake devices, wherein said means for overriding comprises linkages for applying the first and second brake devices, a common bar connected to said linkages and means for moving the bar for applying and releasing application of both the first and second brake devices, and wherein said means for moving the bar includes a spring for biasing said bar in a direction for applying both said first and second barking devices and a hydraulic piston-cylinder for opposing the biasing of said spring to release application of both braking devices when hydraulic pressure is applied to said piston-cylinder.

4,892,361

HYDRAULIC BRAKE BOOSTER

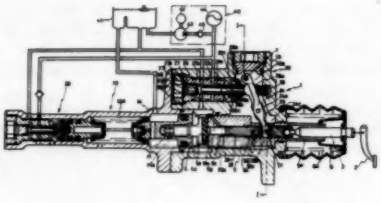
Michiharu Nishii, Toyota, and Yoshihiko Tada, Hazu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 12, 1988, Ser. No. 231,439

Claims priority, application Japan, Aug. 13, 1987, 62-202255

Int. Cl.[4] B60T *13/12*

U.S. Cl. 303—114 **3 Claims**



1. A hydraulic brake booster for actuating a master cylinder by a hydraulic power pressure supplied from a power source in response to an input rod connected to a brake pedal comprising:

a housing connected to said master cylinder,

a power piston slidably disposed in a boost chamber which is defined in said housing and transmitting a boost force which is generated in response to said input rod,

a hydraulic pressure control valve having a valve body moved between a power position communicated with said power source and an initial position communicated with a reservoir in said boost chamber on an exist extending substantially in parallel with a sliding axis of said power piston,

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4,892,362

ANTILOCKING APPARATUS FOR VEHICLE BRAKES

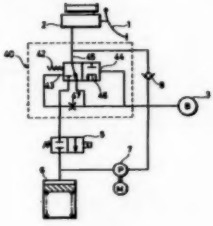
Koji Takata, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 9, 1988, Ser. No. 230,617

Claims priority, application Japan, Aug. 13, 1987, 62-202114

Int. Cl.[4] 303 *68, 84.2, 113, 114, 115, 116, 117, 119;* 188 *131 A*

U.S. Cl. 303—115 3 Claims



1. An antilocking apparatus for performing an antilocking operation for a wheel brake of a vehicle, said antilocking apparatus comprising a master cylinder; an inlet valve provided in a fluid path connecting said master cylinder with said wheel brake for selectively allowing and cutting off communication between said master cylinder and said wheel brake through said fluid path; an electrically switch-controlled outlet valve capable of discharging a working fluid from a fluid path portion connecting said inlet valve with said wheel brake; a damping reservoir for temporarily storing said working fluid discharged through said outlet valve; a pump for drawing said working fluid stored in said damping reservoir and delivering said working fluid into said fluid path portion connecting said inlet valve with said wheel brake, said inlet valve comprising differential pressure responsive valve means actuated by a differential pressure between fluid pressure in said fluid path portion connecting said inlet valve with said wheel brake and fluid pressure in a fluid path portion connecting said inlet valve with said outlet valve, said differential pressure responsive valve means comprising a casing, a spool slidable along an inner surface of said casing, said spool having a first end facing a fluid path portion communicating with said wheel brake and a second end facing a fluid path portion communicating with said outlet valve, and a spring for normally urging said spool toward said first end, said spool having an orifice connecting said fluid path portion communicating with said wheel brake and said fluid path portion communicating with said outlet valve, said casing having a plurality of ports and a casing configuration for cooperation with said spool, said spool having fluid passages and a spool configuration located for cooperation with respective ones of said ports and configuration in said casing depending on a first, a second, and a third relative position between said casing and said spool for implementing three respective operational states, including a first operational state allowing communication between said master cylinder and said wheel brake through a large passage of said passages in said spool, communication between said master cylinder and said outlet valve through said orifice, and communication between said wheel brake and said outlet valve through said orifice; a second operational state cutting off communication between said master cylinder and said wheel brake and between said master cylinder and said outlet valve, and allowing communication between said wheel brake and said outlet valve through a large passage of said passages in said spool; and a third operational state cutting off communication between said master cylinder and said wheel brake and between said master cylinder and said outlet valve, and allowing communication between said wheel brake and said outlet valve through said orifice.

4,892,363

ANTI-LOCKING BRAKE SYSTEM

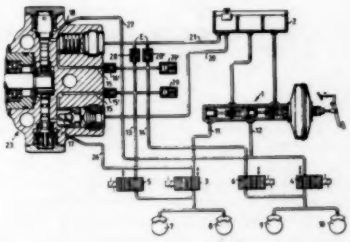
Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 317,153

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807552

Int. Cl.[4] B60T *8/32*

U.S. Cl. 303—116 7 Claims



1. In an anti-locking brake system in which the pressure acting on the wheel brakes is reduceable by bleeding hydraulic fluid through a return line (13, 14), with a hydraulic pump whose suction chamber (17, 18) includes a check valve incorporated therein and is connected through a suction line (20, 21) to a hydraulic fluid reservoir, the improvement comprising connecting said return line (13, 14) to said suction chamber and having the chamber terminate in said suction line, positioning a first valve (28, 28') in said return line (13, 14) upstream of a junction point (E) between said return line and said suction line, and wherein a suction valve (15', 16') is inserted in said return line (13, 14) near the point of connection to said hydraulic pump, said suction valve being disposed nearer to said hydraulic pump than to said first valve (28, 28').

4,892,364

SYSTEM FOR THE OPERATION OF AN AUXILIARY PUMP

Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,276

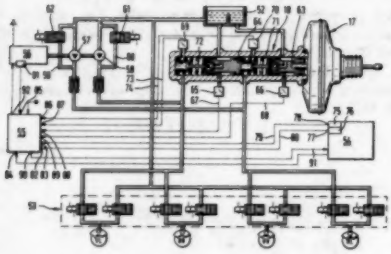
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 3813172

Int. Cl.[4] B60T *8/48*

U.S. Cl. 303—116 15 Claims

1. A system of operating an auxiliary pump of an electro-hydraulic control system for hydraulic brake systems and particularly of automotive vehicles brake pressure control means, in particular, an anti-locking brake control system (ALC-system), including a master cylinder exhibiting at least one working piston and one working chamber, preferably at least one pressure modulator having at least one passage valve and blocking valve, for the modulation of the hydraulic pressure in the individual wheel cylinders during the control mode, at least one electronic pump controller adapted to accept signals from at least one wheel sensor means, said controller adapted to form regulated signals for operation of said at least one passage and blocking valves of said at least one pressure

modulator, motion sensor means being provided so that the motions of said working piston are sensed and manifested in the form of electric way sensor signals, at least one algorithm means connected with said at least one electronic controller whereby the volume requirements of said master cylinder are determined by said at least one electronic controller in accordance with said algorithm means installed therein which de-



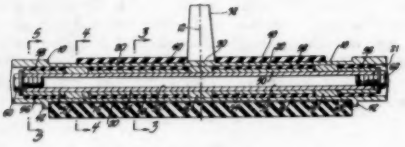
fines volume patterns that are made available at the output of said electronic controller in the form of volume requirement-indicating electric signals, in that said way sensor signals and said volume requirement-signals in said electronic pump controller are processed to form a predetermined regulated quantity and said regulated quantity is employed for controlling the rate of delivery of said auxiliary pump.

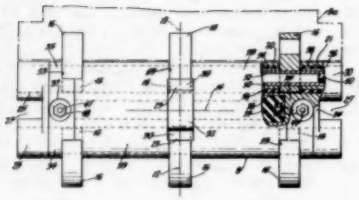
4,892,365

TRACK UNIT FOR USE IN A VEHICLE TRACK ASSEMBLY

Geza C. Szakacs, 2168 Belle Vernon Dr., Rochester Hills, Oakland, Mich. 48309

Filed May 4, 1988, Ser. No. 197,010
Int. Cl.[4] B62D *55/21, 55/18*
U.S. Cl. 305—58 R **14 Claims**





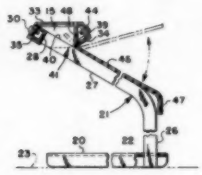
1. A double pin track unit comprising a track body having a transverse centerline; two cylindrical bores extending continuously through the track body parallel to the transverse centerline; a track pin located entirely within each bore; each track pin comprising a single rod extending substantially the full width of the track body; a plurality of links extending radially out of the bore, the links keyed within the bore to the rod, the links having a curved end surface congruently and adjacently facing an inner peripheral surface of the bore; sleeves keyed to the rod, the sleeves being alternated and abutted with the links along the entire length of the rod such that each link is between two sleeves; means for holding sleeves at the ends of the rod in fixed axial relation to the rod, whereby the rod, all the sleeves and the links are axially fixed relative to one another; and an annular elastomeric bushing surrounding each sleeve within the associated transverse bore.

4,892,366

SNEEZE GUARD SYSTEM

Donald Yerman, Euclid, Ohio, assignor to Crescent Metal Products, Inc., Cleveland, Ohio

Continuation of Ser. No. 658,810, Oct. 9, 1984, abandoned. This application May 12, 1989, Ser. No. 352,648
Int. Cl.[4] A47B *96/18*
U.S. Cl. 312—140.4 **14 Claims**



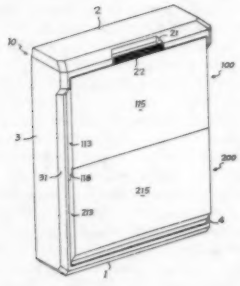
1. A sneeze guard system comprising a sneeze guard panel, support means for supporting said sneeze guard panel in a first position, and means for mounting said sneeze guard panel to said support means in such first position while permitting removal of said sneeze guard panel upon pivoting to a second position, said sneeze guard panel having an upwardly turned top edge portion opwerative in such first position of said sneeze guard panel to interfere with said means for mounting to hold said sneeze guard panel on said support means and in such second position to clear said means for mounting to permit removal of said sneeze guard panel.

4,892,367

STORAGE CABINET WITH PIVOTING STORAGE COMPARTMENTS

Eric Jantzen, Ville d'Avray, France, assignor to Gefitec S.A., Lausanne, Switzerland

Filed Sep. 27, 1988, Ser. No. 249,843
Claims priority, application France, Sep. 30, 1987, 87 13538
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—328 **8 Claims**



1. A storage cabinet with pivoting storage compartments, comprising

a frame,

at least two superimposed rows of like storage modules pivotally mounted on the frame upon respective parallel, horizontal pivot axes spaced a distance y apart, so that corresponding points on vertically adjacent modules also lie a distance y apart,

at least one connecting rod interconnecting said rows of modules so as to cause them to pivot in unison between open and closed positions,

each storage module being delimited by front and rear planar walls having respective upper and lower edges, and by two lateral end walls and a bottom, the front walls of the storage modules being substantially coplanar in the closed position, the upper edge of the rear wall and the lower edge of the front wall of each module lying in paprallel planes a distance x apart, where x is less than the distance y, the upper edge of the rear wall of one module being lower that the lower edge of a front wall of its upper adjacent module, and the lower edge of a lateral wall of a module having a shape which is the complement of the upper edge of the corresponding lateral wall of the lower adjacent module so that all the superimposed storage modules, except for the upper part of the upper storage module, are entirely closed by themselves, independently of the frame, in the closed position,

wherein an angle of rotation B between the open and closed positions of the storage modules is determined according to the equation $\sin\beta = x/y$, the difference z between the levels of said lower edge and of said upper edge being calculated according to the equation $z = y(1-\cos\beta)$,

and wherein, in the open position, the upper edge of the rear wall of the lower module abuts flat against the lower edge of the front wall of the upper module, thus precisely terminating the rotational movement of the modules and ensuring the continuity of the rear wall of each lower storage module with the front wall of its upper adjacent storage module in such a way that the two walls are substantially coplanar in the open position, whereby the entire useful storage volume of each storage module is visible and accessible.

4,892,368

DRAWER SLIDE

Takashi Goto, Euless, Tex., and George E. Malcom, Elkhart, Ind., assignors to Malgo Corporation, Grand Prairie, Tex.

Filed Oct. 3, 1988, Ser. No. 252,119
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—348 **4 Claims**

1. A combination drawer slide and track comprising:

a body member;

a pair of spaced guides depending downward from said body member a predetermined depth for engaging a mating track, each of said guides having a vertical wall portion and a perpendicular lip, the vertical wall portion and lip together defining a L-shaped cross section;

a mating track having opposed channel regions which provide a sliding fit above and below said guides for substantially the entire length of said guides;

a stop member extending upwardly between said channel regions near an outer extent of said track;

a primary strut interconnecting said spaced guides in transverse fashion, said primary strut having a rigid, vertically extending front wall which extends for a preselected depth, less than the depth of said guides, to engage said stop provided in said mating track and having a beveled rear face for sliding over said stop as the drawer is being mounted;

wherein the depth of said rigid, vertically extending front wall is selected to allow said primary strut to ride over said stop when said guides are canted at an angle in said mating track to thereby release said drawer slide;

a plurality of spaced nubs extending upwardly along said perpendicular lip on the exterior of said spaced guides to limit the vertical travel of said guides in said mating tracks, whereby it is necessary to cant said guides at an angle in said mating track to release said drawer slide; and

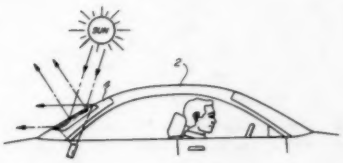
wherein the necessary cant angle can only be achieved once a predetermined number of spaced nubs have cleared the mating tracks in withdrawing said drawer slide from said tracks.

4,892,369

HOLOGRAPHIC REAR WINDOW STOPLIGHT

Gaylord E. Moss, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 6, 1987, Ser. No. 793
Int. Cl.[4] G02B *5/32*; G03H *1/28*; F21Q *1/00*; B60Q *1/44*
U.S. Cl. 350—3.7 **27 Claims**



18. An improved rear stoplight assembly capable of being mounted within the field of view of the rearview window of a vehicle without obscuring the vision of the driver, comprising:

means for providing a stoplight within the rearview window including a substantially transparent and colorless stoplight member mounted adjacent the rear window and within the rearview vision of the driver;

means for activating the stoplight member to produce a light directed to the rear of the vehicle of a characteristic wavelength band for a stoplight that is substantially visible only to an observer behind the vehicle and not to the driver, the driver's field of view extending through the stoplight member regardless of its activation; and

a holographic image of said substantially transparent and colorless stoplight member and a reflection holographic image on said means for providing a stoplight member both having a series of parallel fringes, the respective orientation of the fringes of the image of said stoplight member directing the light from the means for activating the stoplight member to produce a light to said reflection holographic image and then rearward at a position approximately parallel to said rearview window of the vehicle whereby exterior incident light will not be reflected forward through said stoplight member into the line of sight of the driver as he looks through his rearview mirror.

4,892,370

MEANS AND METHOD FOR IMPLEMENTING A TWO-DIMENSIONAL TRUTH-TABLE LOOK-UP HOLGRAPHIC PROCESSOR

Yun-Parn T. Lee, 3991A Miramar St., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 23,676, Mar. 9, 1987, abandoned. This application Feb. 17, 1988, Ser. No. 157,276
Int. Cl.[4] G02B *5/32*; G06G *9/00, 7/16*
U.S. Cl. 350—3.74 **39 Claims**

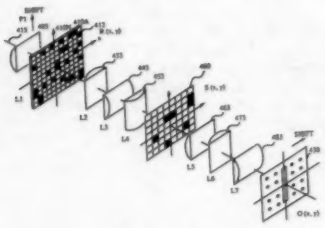
1. An optical processor for generating a looked-up digital light signal from input and output data of a truth-table, which comprises:

means for detecting and coding an input light signal emitted by a light source, said light signal representing a plurality of digital input vectors for said binary truth-table;

input means for receiving said input light signal and for transforming said plurality of digital input vectors into a boolean basis vector, in conformance with a predetermined transform;

means for multiplying said boolean basis vector by the truth-table output data corresponding to said input light signal;

optical means impinged by said boolean basis vector for storing a product of said means for multiplying;



means for presenting said product as a spectral expansion vector having coefficients which can be positive, negative or zero, of said output data;

means for performing an inner product of said spectral expansion vector with said boolean basis vector and for generating an output light signal corresponding to said output data; and

output means for receiving said output light signal exiting from said means for generating.

4,892,371

SEMICONDUCTOR LASER ARRAY LIGHT SOURCE AND SCANNER

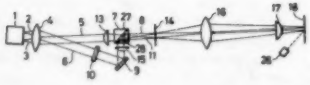
Kunio Yamada, and Shigeru Tsukada, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,470

Claims priority, application Japan, Dec. 4, 1986, 61-289652

Int. Cl.[4] G02B *26/10, 27/14*

U.S. Cl. 350—6.8 **17 Claims**



1. A semiconductor laser array light source comprising:

semiconductor laser array means having a plurality of luminous points;

lens means for condensing a plurality of beams emanating from said semiconductor laser array means and for directing the plurality of beams along a plurality of optical paths;

optical means having first and second incident surfaces having first and second angles of incidence, respectively, different from each other, said first incident surface transmitting one of said plurality of beams incident thereon; and

optical-path changing means for directing a second of said plurality of beams to said second incident surface of said optical means and for adjusting a relative arrangement of optical axis of said plurality of beams emanating from said optical means.

4,892,372

ROTATING POLYGON MIRROR

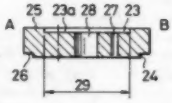
Hideo Chonan, Toride; Michio Motohashi, Tokyo; Hirotaka Noguchi, Yawahara; Kazuo Ogawa, Ibaraki, and Kimio Takahashi, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,734

Claims priority, application Japan, Aug. 31, 1984, 59-180497

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.8 **11 Claims**



1. A rotating polygon mirror including a polygon cylinder having upper and lower surfaces and a side, said mirror comprising:

at least one reflection mirror surface formed on the side of the polygon cylinder;

a first mount portion formed in the upper surface for engaging with a first mount member of a scan device;

a second mount portion formed in the lower surface for engaging with a second mount member of the scan device; and

a surface formed in at least one of said first and second mount portions to be used as a mount reference surface when said rotating polygon mirror is mounted on the scan device;

one of said first and second mount portions having a recess and the other of said first and second mount portions having a projection such that, when two identical rotating polygon mirrors are stacked with said first and second mount portions abutting each other, said mount reference surface formed in at least one of said first and second mount portions of one rotating polygon mirror does not contact the other of the first and second mount portions of the other rotating polygon mirror.

4,892,373

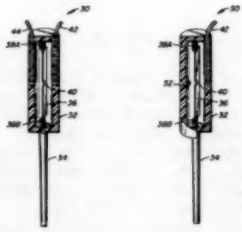
SIGN BIT OPTICAL GEOPHONE

Swan A. Sie, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 9, 1983, Ser. No. 560,016

Int. Cl.[4] G02B *6/00, 6/14*

U.S. Cl. 350—96.10 **17 Claims**



1. An optical geophone comprising:

optical fiber means for transmitting an optical signal to a geophone case;

light chopping means located within said case, said light chopping means

positioned so that either the movement up or down along its vertical axis of movement passes or blocks light while a movement in the opposite direction along the vertical axis

blocks or passes light, said light chopping means configured to be at least equal to or longer than about one-half of the expected total amplitude of the up and down movement along the vertical axis;

oscillating means connected to said chopping means, said oscillating means capable of oscillating said chopping means along said chopping means vertical axis in response to geological movement thereby creating a

binary signal of either light or no-light; and

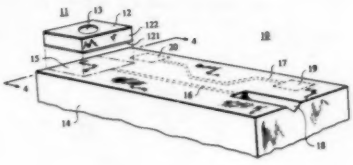
signal return directing means for returning the chopped light signal to the seismic vehicle.

4,892,374

ARTICLE COMPRISING AN OPTO-ELECTRONIC DEVICE AND AN OPTICAL WAVEGUIDE COUPLED THERETO, AND METHOD OF MAKING THE ARTICLE

David A. Ackerman, Hopewell, and Louis A. Koszi, Scotch Plains, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1988, Ser. No. 163,689
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 **7 Claims**



7. An article comprising a substrate, with an optoelectronic device and an optical waveguide on the substrate, the device comprising a semiconductor body and at least one metallization layer at least partly covering a major surface of the semiconductor body,

characterized in that

(a) the device is mounted on the substrate in a position adapted for coupling radiation from the device into the waveguide and/or from the waveguide into the device; and

(b) the metallization layer comprises a window such that pump radiation can be transmitted into the semiconductor body, whereby the device can be caused to emit radiation by photoluminescence, with at least some of the radiation coupled into the waveguide.

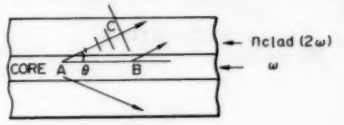
4,892,375

FIBER-TYPE LIGHT CONVERSION DEVICE

Kiyofumi Chikuma, and Sota Okamoto, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,058
Claims priority, application Japan, May 20, 1988, 63-123414
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 **1 Claim**

1. A fibre-type light conversion device comprising a fibre-type conversion element for changing the wavelength of an incident light, and a converging lens for converging said incident light whose wavelength is changed by said conversion element, wherein said converging lens is a single lens having an aspherical surface configured such that a distance Zi from a plane perpendicular to an optical axis of said lens and passing an extremity of said lens to a point on said aspherical surface having a height Y from the optical axis is expressed by the following equation



$$Zi = \frac{CiY^2}{1 + \sqrt{1 - KiCi}} + A_1(i)Y + A_4(i)\,Y^4 + A_6(i)\,Y^6 + A_8(i)\,Y^8 + A_{10}(i)\,Y^{10}$$

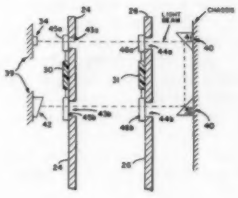
where Ci is an inverse number of the radius of curvature of an "i"th surface at an intersecting point between the "i"th surface and the optical axis, Ki, $A_1(i) \sim A_{10}(i)$ are constants, and Y is the height from the optical axis to the refracting surface of said lens.

4,892,376

OPTICAL BACKPLANE FOR CIRCUIT BOARDS

William A. Whitehouse, Poulsbo, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 26, 1989, Ser. No. 301,852
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 **9 Claims**



1. An apparatus comprising:

a chassis;

a first circuit card mounted on the chassis and having a first hole;

a first circuitry mounted on the first circuit card;

a second circuit card mounted on the chassis and having a second hole aligned with the first hole;

second circuitry mounted on the second circuit card; and

a means for optically transmitting information from the first circuitry to the second circuitry comprising:

a light source that generates a light beam through the first hole of the first circuit card and the aligned second hole of the second circuit card;

an optical modulator mounted at the first hole of the first circuit card for modulating information onto the light beam; and

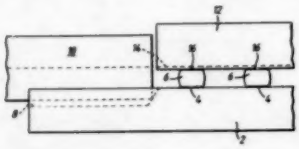
an optical demodulator mounted at the second hole of the second circuit card for receiving the light beam from the optical modulator and reading information from the light beam.

4,892,377

ALIGNMENT OF FIBRE ARRAYS

Frederick A. Randle, Northants, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 19, 1988, Ser. No. 233,757
Claims priority, application United Kingdom, Aug. 19, 1987, 8719557
Int. Cl.[4] G02B 6/42
U.S. Cl. 350—96.2 9 Claims



1. A method for aligning an array of optical fibres with a corresponding array of optical components included as part of a block, the method comprising:

providing a substrate having a first major plane surface that is solder repellent and bears upon said first major plane surface a first array of solder wettable pads, each of said pads of said first array are a predetermined area, and in said substrate an array of grooves is defined, each of said grooves is aligned with, and is located in an accurate lateral relationship to, said array of solder wettable pads;

providing said corresponding optical component on said block, said block having a solder-repellent second major plane surface and has a second array of solder wettable pads, each of said pads of said second array are a predetermined area, and are located relative to each other at positions in one-to-one correspondence with corresponding positions of said solder wettable pads of said first array;

depositing on at least one of said solder pads of said first and said second arrays controlled amounts of solder;

mounting said block above said substrate with said first and second major plane faces facing;

reflowing said solder to form solder drops of predetermined dimensions, said solder drops securing said block at a predetermined height above said first major plane surface, and positioning said block both laterally and longitudinally in relation to said substrate; and

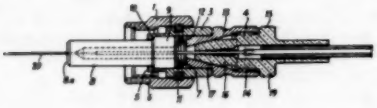
locating each one of said optical fibres in a respective one of said grooves defined in said substrate to align said array of optical fibres and said array of optical components.

4,892,378

PROCESS FOR MOUNTING AN OPTICAL FIBER IN AN OPTICAL-FIBER CONNECTOR ELEMENT, AND A CONNECTOR ELEMENT FOR CARRYING OUT THE PROCESS

Elie Zajac, and Gilbert Manoff, both of Gagny, France, assignors to Radiall, Rosny Sous Bois, France

Filed May 19, 1988, Ser. No. 196,045
Claims priority, application France, May 21, 1987, 87 07138
Int. Cl.[4] G02B 6/36, 7/26
U.S. Cl. 350—96.20 8 Claims



1. Process of mounting an optical fiber in a connector element comprising a peripheral assembly nut; a body whose frontal end surface defines a reference plane, provided at its rear end with means for retaining an optical fiber introduced from the rear of said body; a ferrule in which the stripped end of the optical fiber may be positioned, which is accommodated in said body and projects axially therefrom toward the front, the frontal end face of said ferrule being located at a predetermined axial distance from said plane of reference; characterized by the fact that after the end of an optical fiber (20) has been stripped, it is mounted from the rear in the connector element so that it projects axially from the frontal end (8a) of the ferrule (8); the non-stripped part of the optical fiber is immobilized at the rear of the connector body; the axial position of the stripped part of the fiber relative to the frontal face of the ferrule is modified by a mechanical force applied to one of the fiber and the ferrule; by means of a scribing tool (27) positioned precisely with respect to the plane of reference, a scratch is made in predetermined relation to the plane of the frontal face of the ferrule; the fiber is broken at the position of the scratch; and one of the fiber and the ferrule is allowed to return elastically.

4,892,379

FIBER OPTIC CONNECTOR

Mitsuru Takeda, and Koji Mizunuma, both of Tochigi, Japan, assignors to Amphenol Corporation, Wallingford, Conn.

Filed Jun. 25, 1984, Ser. No. 624,445
Claims priority, application Japan, Jul. 4, 1983, 58-102736[U]
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 21 Claims

1. In a fiber optic connector assembly in which two fiber optic connectors are connected to each other by means of an adaptor, each of the connectors including at least one ferrule, said ferrules retaining an optical fiber, and said ferrules being inserted in said adaptor such that the optical fiber of each connector is arranged in a light transmitting position with respect to the optical fiber of the other connector, the adaptor including at least one split sleeve for receiving at its opposite ends a ferrule from each of said connectors, said split sleeve having a longitudinal slit, the improvement comprising:

a tubularly shaped elastic body installed around the outer periphery of said split sleeve, said body applying a spring force to the periphery of said split sleeve.

4,892,380

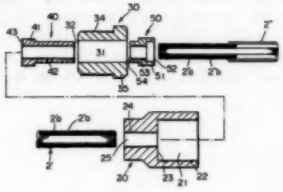
OPTICAL CONNECTOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 286,402
Claims priority, application Japan, Apr. 20, 1988, 63-98767
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.21 1 Claim

1. An optical connector for connecting each other two optic cable members, each of which includes an optic cable end having a smoothly finished surface and firmly secured in a protective tube with an externally-threaded end to be connected, comprising a first cap-nut-shaped connecting member having an internally threaded socket with a flat bottom to threadably engage with the threaded protective tube end of the first optic cable, a second bolt-shaped connecting member having a bore there-through and threadably engaged with said first cap-nut-shaped connecting member, a third connecting

member and a fourth connecting member loosely inserted in the through-bore of the second bolt-shaped connecting member and having a flange at its opposite sides for threadably engaging with the threaded tube end of the second optic cable member, characterized in that the end-surfaces of the fiber optic cable member and the second optic cable member are



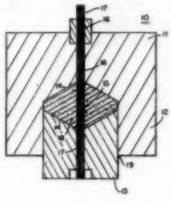
arranged opposite to each other, the third member's flange being caught between the second connecting member's bottom surface and the first connecting member's socket bottom surface and the fourth connecting member being screwed onto the protected tube-end of the second optic cable member to form a light-guiding passage.

4,892,381

HIGH TEMPERATURE FIBER OPTIC CONNECTOR

William M. Glasheen, Derry, N.H., assignor to Ametek, Inc., New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,063
Int. Cl.[4] G02B 7/26
U.S. Cl. 350—96.22 **13 Claims**



1. A high temperature optic fiber connector comprising:
(a) a connector body having an interior chamber;
(b) axial passage means through said body communicating with said chamber;
(c) at least one metal coated fiber positioned in said axial passage means and passing through said chamber;
(d) means for bonding said metal coated optic fiber to the walls of said chamber including a sintered metallic compact adhering both to said optic fiber and said wall, said compact containing the same metal as the metal coating of said fiber.

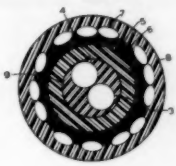
4,892,382

DIELECTRIC OPTICAL DROP CABLE

Christopher A. Story, Hickory, and Susan M. Cooper, Newton, both of N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Sep. 26, 1988, Ser. No. 249,112
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **2 Claims**

1. An optical fiber cable comprising:
(a) a first tube which is made of a flame retardant material;
(b) at least one optical fiber and a hydrophobic filling compound disposed in the first tube;
(c) a first layer of densely packed loose glass yarn material circumscribing the first tube;
(d) a second layer of glass fiber members impregnated with resinous material circumscribing the first layer; and



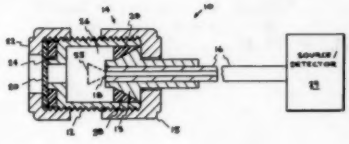
(e) a second tube which is made of a flame retardant material circumscribing the second layer.

4,892,383

RESERVOIR FIBER OPTIC CHEMICAL SENSORS

Stanley M. Klainer, San Ramon; Kisholoy Goswami, Walnut Creek, both of Calif.; Nelson R. Herron, Lachini, Mich.; Stephen J. Simon, and Lawrence A. Eccles, both of Las Vegas, Nev., assignors to FiberChem Inc., Las Vegas, Nev.

Filed Feb. 17, 1989, Ser. No. 312,645
Int. Cl.[4] G02B 6/02; H01J 5/16; A61B 5/00; G01N 21/00
U.S. Cl. 350—96.29 **20 Claims**



1. A reservoir cell assembly for a fiber optic chemical sensor, comprising:
a modular cell body having a predetermined length and enclosing a predetermined volume and having two open ends;
a semipermeable membrane positioned at one open end of the cell body;
quick attach membrane retainer means which fit securely to one open end of the cell body to hold the membrane in place so that a predetermined chemical species may selectively diffuse through the membrane into the cell;
quick attach fiber optic connector means which fit securely to the other end of the cell body to hold the fiber optic positioned with its tip extending through the connector means into the cell body.

4,892,384

BINOCULAR MAGNIFIER

Zenjiro Okamoto, Hyogo, Japan, assignor to Kabushiki Kaisha AG, Osaka and Zenjiro Okamoto, Hyogo, both of, Japan

Filed Jul. 31, 1987, Ser. No. 80,340
Claims priority, application Japan, Aug. 27, 1986, 61-130520
Int. Cl.[4] G02B 25/00; G02C 7/02
U.S. Cl. 350—145 **4 Claims**

1. A binocular magnifier for weak-sighted persons comprising:
a meniscus convex lens for the right eye retained in front of the right eye, said lens for the right eye having a satisfactorily large diameter to ensure a wide field of view, said lens for the right eye being disposed eccentrically in such a manner that the optical axis of said lens is parallel to the visual axis of the right eye in the short-distance working

region and located on the side of said visual axis which is closer to the left eye;

a meniscus convex lens for the left eye retained in front of the left eye, said lens for the left eye having a satisfactorily large diameter to ensure a wide field of view, said lens for the left eye being disposed eccentrically in such a manner

that the optical axis of said lens is parallel to the visual axis of the left eye in the short-distance working region and located on the side of the visual axis of said left eye which is closer to the right eye; and

said two meniscus convex lenses being spliced together in one unit at the median position between the right and left eyes.

4,892,385

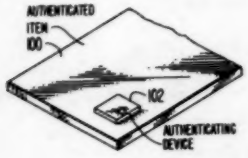
SHEET-MATERIAL AUTHENTICATED ITEM WITH REFLECTIVE-DIFFRACTIVE AUTHENTICATING DEVICE

William M. Webster, Jr., Princeton, and John P. Russell, Pennington, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,970

Int. Cl.[4] G02B *5/18*; B44F *1/12*

U.S. Cl. 350—162.23 **2 Claims**



1. An article comprising an authenticated item of sheet material which is subject to counterfeiting and an authenticating device bonded to said item, wherein said device includes:

a substrate bonded to said sheet material, said substrate having a predetermined reflective diffraction grating structure formed as a relief pattern that is situated on at least one region of a viewable surface of said substrate,

a transparent material filling and covering said reflective diffraction grating structure, said transparent material exhibiting a given index-of-refraction greater than unity,

wherein said relief pattern forming said structure has a rectangular grating profile, physical amplitude and line frequency parameters such that said structure is operative to separate polychromatic illuminating light incident thereon into at least one pair of adjacent, separate and distinct, reflected beams of contrasting colors, wherein the size of the narrowest angular dimension of the beam-width of each of said beams at a distance of thirty centimeters is at least two milliradians, said physical amplitude and line frequency parameters being such that, in cooperation with said given index-of refraction, said structure diffracts through at least a certain angle, determined by said line frequency, a portion of said polychromatic illuminating light to discriminatingly transfer, as a predetermined function of wavelength of the wavelength spectrum of said polychromatic light, some certain fraction of each spectral component of said polychromatic illuminating light into orders higher than the zero diffraction order and transfer substantially the entire remainder of said polychromatic illuminating light into the zero diffraction order, said certain angle being sufficient to obtain zero and higher diffraction order reflected beams that are separate and distinct from one another, whereby the color of said zero diffraction order reflected beam is the complement of the color of the aggregate of all the diffraction order beams higher than said zero diffraction order, and

wherein said transparent material is bonded to said viewable surface of said substrate in a manner sufficiently secure to prevent said transparent material from being removed from said structure without effectively destroying said structure.

4,892,386

ON-VEHICLE HEAD UP DISPLAY DEVICE WITH DOUBLE IMAGES ANGULARLY SEPARATED LESS THAN A MONOCULAR RESOLVING POWER

Yoshiyuki Suzuki; Tatsumi Ohtsuka; Tadashi Iino, all of Susono; Akihisa Kasahara, and Noriyasu Tomiyama, both of Tokorozawa, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

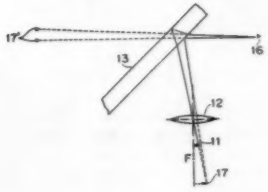
Division of Ser. No. 907,148, Sep. 12, 1986, Pat. No. 4,787,711.

This application Jun. 2, 1988, Ser. No. 201,411

Claims priority, application Japan, Jan. 23, 1986, 61-011123; Mar. 28, 1986, 61-068467

Int. Cl.[4] G02B *27/10, 17/08*

U.S. Cl. 350—174 **5 Claims**



1. An on-vehicle head-up display apparatus wherein a windshield glass having inner and outer surfaces of a vehicle is utilized as a catoptric system to reflect an image of various information in the vehicle from said inner and outer surfaces of said windshield glass, comprising:

display means for indicating said information; and

an optical system positioned between said windshield glass and said display means for forming an indication image of said indicated information having an object point therein, light beams from said object point impinging upon said inner and outer surfaces of the windshield glass to be reflected to form a virtual image in a doubled state at a finite distance outside the windshield glass, and said optical system forming said indication image beyond said display means to form an angle defined by said reflected light beams reflecting from said inner and outer surfaces thereof, which is smaller than a monocular resolving power.

4,892,387

LIGHT CONTROLLING SHEET

Noboru Takeuchi, Aichi; Masakazu Goto, Konan; Hiroaki Takahashi, Gifu, and Takeshi Kojima, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

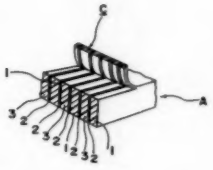
Continuation of Ser. No. 918,903, Oct. 15, 1986, Pat. No. 4,722,097. This application Jul. 20, 1988, Ser. No. 221,874

Claims priority, application Japan, Sep. 20, 1986, 61-222466; Sep. 25, 1986, 61-227535

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] G02B *27/00*

U.S. Cl. 350—319 6 Claims



1. A light controlling sheet for use for optical indicators comprising:

louver element means including an arbitrary pattern of walls having openings therebetween, inner surfaces of said walls defining said openings and extending in a direction of thickness of said louver element means, said walls being constructed of an opaque material for absorbing incident light;

transparent layers for permitting incident light to pass therethrough; and

light reflection layers for reflecting incident light;

said transparent layers and the light reflection layers being mutually arranged in a side-by-side arrangement adjacent to each other with a wall of said louver element means being interposed therebetween.

4,892,388

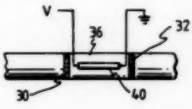
METHOD FOR PRODUCING REFLECTIVE TAPS IN OPTICAL FIBERS AND APPLICATIONS THEREOF

Henry F. Taylor, College Station, Tex., assignor to Texas A & M University System, College Station, Tex.

Division of Ser. No. 108,270, Oct. 13, 1987, Pat. No. 4,848,999. This application Dec. 19, 1988, Ser. No. 286,055

Int. Cl.[4] G02B *6/00*; C22B *4/00*; C03B *23/20*

U.S. Cl. 350—320 10 Claims



1. A method of forming variably reflective optical taps, comprising:

forming two optical mirrors along a continuous length of optical fiber such that the mirrors are separated by a length of optical fiber, the combination forming a Fabry-Perot cavity;

depositing an electrically resistive medium on the fiber between the two mirrors, such that the reflectivity of the cavity will vary upon the passage of electrical current through said medium.

4,892,389

METHOD OF DRIVING A DISPLAY DEVICE AND A DISPLAY DEVICE SUITABLE FOR SUCH A METHOD

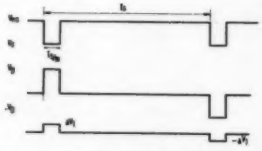
Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1987, Ser. No. 106,084

Claims priority, application Netherlands, Oct. 28, 1986, 8602698

Int. Cl.[4] G02F *1/133*; G09G *3/36*

U.S. Cl. 350—333 18 Claims



1. A method of driving a display device, said display device including an electro-optical display medium between two supporting plates, a matrix of picture elements arranged in rows and columns, each of said picture elements being formed by picture electrodes provided on opposing facing surfaces of said two supporting plates, and a system of row and column electrodes adjacent to said picture electrodes of said facing surfaces, said method comprising the steps of

(a) presenting a selection signal to one of said rows of picture elements through one of said row electrodes by using non-linear switching elements arranged in series between said row electrodes and said picture electrodes at one side of said facing surfaces, said selection signal being presented during a time period for selecting said one of said rows of picture elements,

(b) presenting at least a part of a data signal to one of said column electrodes at an opposite facing surface during a portion of said time period, said data signal being presented substantially simultaneously with said selection signal presented to said one of said row electrodes,

(c) presenting a non-selection signal to said one of said row electrodes during the remaining portion of said time period, and

(d) presenting a reference voltage to said column electrodes in the absence of said data signal.

4,892,390

MULTI-LAYERED LIQUID CRYSTAL PANEL WITH TWISTED NEMATIC LIQUID CRYSTAL MATERIAL HAVING POLARIZERS DISPLACED FOR SHARP-RISING CHARACTERISTIC

Fumiaki Funada, Yamatokoriyama; Masataka Matsuura, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 244,820, Mar. 17, 1981, abandoned. This application Feb. 7, 1989, Ser. No. 309,027

Claims priority, application Japan, Mar. 17, 1980, 55-34539

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—335 8 Claims

1. A multilayer liquid crystal display comprising:

two liquid crystal cells disposed adjacent to each other so as to include a common middle substrate plate disposed therebetween and upper and bottom substrate plates disposed on either side thereof, wherein each cell contains twisted nematic liquid crystal material with molecules that are oriented

(i) in the direction r_2^2 at the underside of said upper substrate plate,

(ii) in a direction r_2^1 at an angle of 90° against r_2^2 at the topside of said middle substrate plate,

(iii) in a direction r_1^2 which is opposite to r_2^1 at the underside of said middle substrate plate, and

(iv) in a direction r_1^1 which is opposite to r_2^2 at the topside of said bottom substrate plate; an analyzer above the liquid crystal cells; and

a polarizer underneath the liquid crystal cells, wherein the analyzer is twisted by an angle of $\Delta\theta_1$ against r_2^2, the polarizer is twisted by an angle $\Delta\theta_2$ against r_1^1 in the same direction as the analyzer, and $\Delta\theta_1$ and $\Delta\theta_2$ are essentially the same and are between 3° and 15°.

4,892,391

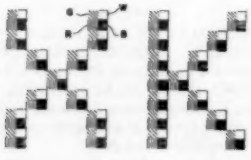
METHOD OF ARRANGING THE CELLS WITHIN THE PIXELS OF A COLOR ALPHA-NUMERIC DISPLAY DEVICE

Wilber C. Stewart, Highstown; Albert P. Pica, East Windsor, and William R. Roach, Rocky Hill, all of N.J., assignors to General Electric Company, Princeton, N.J.

Continuation of Ser. No. 156,061, Feb. 16, 1988, abandoned. This application Jan. 30, 1989, Ser. No. 303,997

Int. Cl.[4] G02F *1/133*; G09G *1/28*; H04N *3/12*

U.S. Cl. 350—339 F **4 Claims**



3. A ethod for producing straight vertical and horizontal alpha-numeric lines and for producing upwardly and downwardly sloping alpha-numeric lines having the same overall appearance in a display device having an array of multi-cell liquid crystal pixels arranged along horizontal and vertical axes, wherein each of said pixels includes a white cell, a green cell, a red cell and a blue cell comprising the steps of:

arranging said white cell and said green cell substantially parallel to one of said axes; and

aligning said green cell and said blue cell diagonally with respect to the other of said axes.

4,892,392

PICTURE DISPLAY CELL AND METHOD OF FORMING AN ORIENTATION LAYER ON A SUBSTRATE OF THE PICTURE DISPLAY CELL

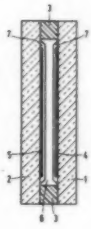
Dirk J. Broer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 92,253, Sep. 1, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,694

Claims priority, application Netherlands, Sep. 4, 1986, 8602235

Int. Cl.[4] G02F *1/13*; B05D *3/06*; C09K *19/00*

U.S. Cl. 350—339 R **12 Claims**



1. A picture display cell comprising as a substrate two oppositely located plates which are transparent to light and which on the facing sides comprise an electrode of a material which is transparent to light having thereon an orientation layer and a sealing ring between the ends of the plate, a liquid crystalline material being provided in the space between the plates and the ring, characterized in that the orientation layer is formed from a monomer or a low molecular weight compound which is first oriented at a given angle essentially only in an electric or magnetic field and is then polymerized.

6. A method of forming an orientation layer on a substrate for a picture display cell comprising an electrode, characterized in that a film of a liquid crystalline monomer is provided in the substrate, the monomer is oriented essentially in a magnetic or electric field at a given angle, and is then polymerized.

4,892,393

FERROELECTRIC LIQUID CRYSTAL COMPOSITION

Kanetsugu Terashima; Mitsuyoshi Ichihashi, both of Ichiharashi; Makoto Kikuchi, Kisarazushi; Fusayuki Takeshita, Ichiharashi, and Kenji Furukawa, Yokosukashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Oct. 12, 1988, Ser. No. 256,413

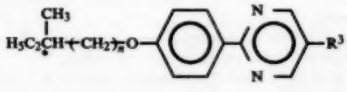
Claims priority, application Japan, Nov. 6, 1987, 62-280625

Int. Cl.[4] G02F *1/13*; C09K *19/34*

U.S. Cl. 350—350 S **3 Claims**

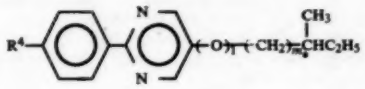
1. A ferroelectric liquid crystal composition comprising at least one member selected from the group consisting of chiral compounds expressed by the following formulas (A-I) to (A-VI) and at least one member selected from the group consisting of compounds expressed by the following formulas (VII) to (XV) and having a spontaneous polarization value of 40 nC/cm^2 or more,

the concentration of said at least one member of chiral compounds of the formulas (A-I) to (A-VI) used being 20 to 80% by weight and the concentration of said at least one member of compounds of the formulas (VII) to (XV) used being 5 to 50% by weight:

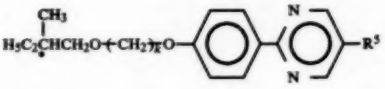


(A-I)

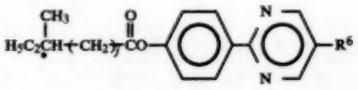
wherein R^3 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; n represents an integer of 2 to 5; and * indicates an asymmetric carbon:


(A-II)

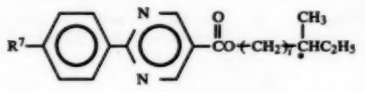
wherein R^4 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; m represents an integer of 2 to 5; l represents 0 or 1; and * indicates an asymmetric carbon atom;


(A-III)

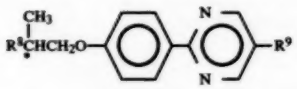
wherein R^5 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; k represents an integer of 2 to 5 carbon atoms; and * indicates an asymmetric carbon atom;


(A-IV)

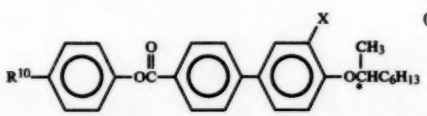
wherein R^6 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; j represents an integer of 0 to 5; and * indicates an asymmetric carbon atom;


(A-V)

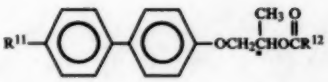
wherein R^7 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; i represents an integer of 0 to 5 carbon atoms; and * indicates an asymmetric carbon atom; and


(A-VI)

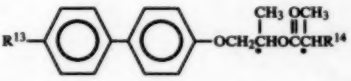
wherein R^8 represents a linear or branched chain alkyl or alkoxy group each of 2 to 8 carbon atoms; R^9 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom.


(VII)

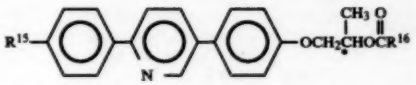
wherein R^{10} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; X represents —H, —F or —CN; and * represents an asymmetric carbon atom;


(VIII)

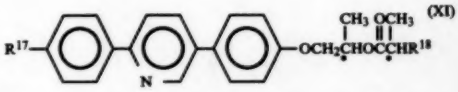
wherein R^{11} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{12} represents an alkyl group of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom;


(IX)

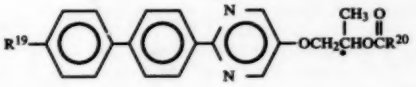
wherein R^{13} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{14} represents a linear or branched alkyl group of 2 to 18 carbon atoms or a linear or branched alkoxy group of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom;


(X)

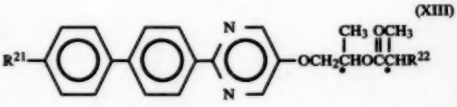
wherein R^{15} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{16} represents a linear chain alkyl group of 2 to 10 carbon atoms or a linear chain alkoxy group of 1 to 18 carbon atoms; and * represents an asymmetric carbon atom;


(XI)

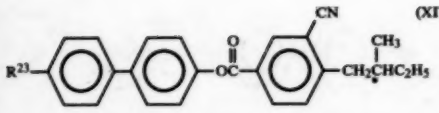
wherein R^{17} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{18} represents a linear chain alkyl group of 2 to 18 carbon atoms or a linear or branched alkoxy group of 1 to 10 carbon atoms; and * indicates an asymmetric carbon atom;


(XII)

wherein R^{19} represents a linear chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{20} represents a linear chain alkyl group of 1 to 18 carbon atoms of a linear chain alkoxy group of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom;

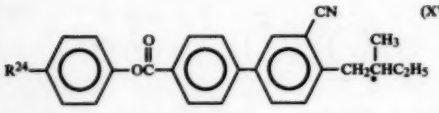

(XIII)

wherein R^{21} represents a linear or branched chain alkyl or alkoxy group of 1 to 18 carbon atoms; R^{22} represents a linear or branched chain alkyl group of 2 to 18 carbon atoms or a linear or branched chain alkoxy group of 1 to 18 carbon atoms; and * represents an asymmetric carbon atom;



(XIV)

wherein R^{23} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom; and



(XV)

wherein R^{24} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom.

4,892,394

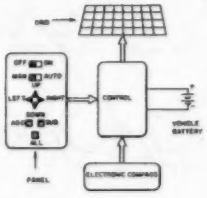
ELECTRONIC SUN SHIELD

Farid M. Bidabad, P.O. Box 41262, San Jose, Calif. 95160

Filed May 3, 1988, Ser. No. 189,947

Int. Cl.[4] G02F *1/17, 1/23*

U.S. Cl. 350—357 **10 Claims**



9. The invention of claim 8, wherein said window comprises a vehicle windshield mounted in a vehicle.

4,892,395

COLLIMATING OPTICAL SYSTEM USING A SPHERICAL LENS

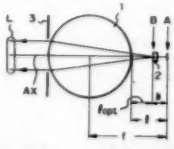
Masayuki Suzuki, Atsugi, and Noritaka Mochizuki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 149,019

Claims priority, application Japan, Jan. 30, 1987, 62-19916

Int. Cl.[4] G02B *3/00*

U.S. Cl. 350—416 **27 Claims**



1. A collimating optical system for collimating a diverging light beam, comprising:

a lens element having a light input surface and a light output surface of essentially common center of curvature, and having a predetermined focal distance;

an origin point of divergence of the diverging light beam being displaced from a focal point of said lens element determined by the focal distance, by a predetermined distance along an optical axis of the system;

said lens element receiving the diverging light beam on the light input surface emitting a collimated light beam from the light output surface.

4,892,396

VARIABLE-FOCUS OPTICAL DEVICE

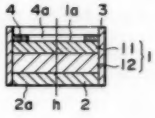
Nobuo Kushibiki, Ebina, and Yoko Yoshinaga, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1987, Ser. No. 53,676

Claims priority, application Japan, May 26, 1986, 61-119182

Int. Cl.[4] G02B *15/00, 3/14*

U.S. Cl. 350—423 **7 Claims**



1. A variable-focus optical device comprising:

an elastomeric member and an aperture member having an aperture adapted for causing projection or sinking of the elastomeric member therethrough or thereat to deform the surface of the elastomeric member;

wherein said elastomeric member is formed of plural elastic layers laminated along an optical axis and comprises an elastomeric material having a storage elastic modulus and a loss elastic modulus respectively in a range of 5×10^2 to 1×10^8 dyne/cm^2, and a dynamic loss factor of not larger than 1, respectively, in a frequency range of 0.1 rad/sec to 1×10^3 rad/sec.

4,892,397

PHOTOGRAPHIC LENS HAVING GHOST IMAGE PREVENTED FROM APPEARING

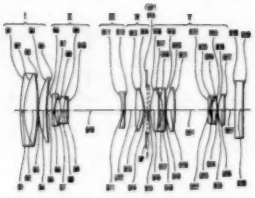
Akihisa Horiuchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 301,951

Claims priority, application Japan, Jan. 29, 1988, 63-018957

Int. Cl.[4] G02B *15/14, 9/64*

U.S. Cl. 350—425 **7 Claims**



1. A zoom lens comprising:

from front to rear,

a first lens unit having a positive refractive power;

a second lens unit for variation of the image magnification having a negative refractive power;

a third lens unit for compensating for the shift of an image

plane resulting from the variation of the image magnification;

a fourth lens unit;

a fifth lens unit having a positive refractive power and hving an image forming function,

wherein the following condition is satisfied:

$$1.05 < f_4/L < 1.3$$

where L is the absolute value of a distance from a point of convergence of an on-axial light beam which has passed said first lens unit through said third lens unit to a front principal point of said fourth lens unit, and f_4 is a focal length of said fourth lens unit.

4,892,398

TRIPLET TYPE OBJECTIVE WITH A DIAPHRAGM ARRANGED BEHIND THE LENS SYSTEM

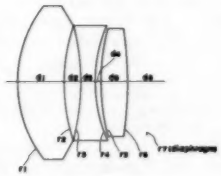
Yoshinobu Kudo; Akira Fukushima; Kazuo Kimura, and Mitsuko Date, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 17, 1988, Ser. No. 272,759

Claims priority, application Japan, Nov. 18, 1987, 62-291479

Int. Cl.[4] G02B *9/14*

U.S. Cl. 350—475 **3 Claims**



1. A triplet type objective comprising,

(a) a lens system which includes from the object side;

a first positive meniscus lens element having an object side surface convex to the object side,

a second biconcave lens element,

a third biconvex lens element,

wherein, the first and the second lens elements are formed of plastic and the third lens element is formed of glass, and

(b) a diaphragm arranged behind the lens system,

(c) wherein the lens system fulfills the following conditions:

$$0.15 < N_3 - N_1 < 0.45$$

$$0.75 < N_2/N_3 < 0.90$$

wherein:

N_1 represents the refractive index of the first lens element;

N_2 represents the refractive index of the second lens element;

N_3 represents the refractive power of the third lens element.

4,892,399

DOOR VIEWER

Chul H. Ahn, #101 Goongjeon Yeonlip, 494-9, Sinwol 2-dong, Kangshu-ku, Seoul, Rep. of Korea

Filed Oct. 7, 1988, Ser. No. 255,069

Claims priority, application Rep. of Korea, Aug. 5, 1988, 1988-10027[U]

Int. Cl.[4] G02B *25/04, 23/02*

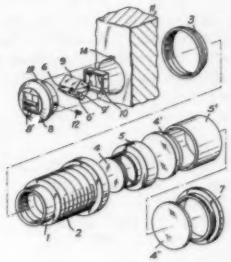
U.S. Cl. 350—569 **6 Claims**

1. A door viewer comprising:

two prisms whose hypotenuse surfaces abut to invert the image of an outside caller ;

a front convex lens inverting again said image inverted by said prisms and having a front concave surface and a rear convex surface ;

an intermediate convex lens widening the angle of said image from said front convex lens ; and



a rear convex eyepiece lens positioned at a predetermined distance from said intermediate convex lens corresponding to the focal lengths of said intermediate convex lens and said rear convex eyepiece lens.

4,892,400

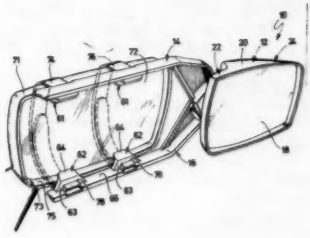
TOWING MIRROR

Geoffrey S. Brookes, Kidderminster, and George J. Wyers, Coseley, both of England, assignors to Blazer International Corporation, Franklin Park, Ill.

Filed Oct. 17, 1988, Ser. No. 258,559

Int. Cl.[4] G02B *5/08*

U.S. Cl. 350—626 **16 Claims**



1. An auxiliary external rearview mirror apparatus which is adapted to be mounted to an existing external mirror member of a vehicle, said existing mirror member including a mirror side having an existing mirror, and a back side, said apparatus comprising:

an auxiliary mirror member;

first and second support arms extending from said auxiliary mirror member for mounting said auxiliary mirror member to an existing extenal mirror member on a vehicle, said first and second support arms being adapted to engage the mirror side of said existing mirror on opposite sides of said existing mirror; and

securing means for securing the auxiliary mirror apparatus to the existing mirror member, said first and second support arms including a first side which faces the mirror side of the existing mirror member when the first and second support arms are mounted to the existing mirror member, and first and second projections extending from the first and second support arms, respectively, the first and second projections each including a depending portion which extends from a second side of its respective support arm in a direction generally towards the other support arm and which includes a surface which is substantially aligned

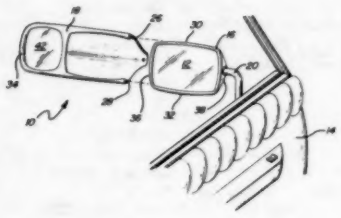
with said first side of its respective support arm to define with the first side of its respective support arm a first seating surface to seat the mirror side of the existing mirror member, and an extending portion which extends outwardly from the depending portion beyond the first side of the support arm to define a second seating surface to seat the mirror side of the existing mirror member, the first and second seating surface of each support arm defining first and second generally L-shaped seats for seating the mirror side of the existing mirror member on opposite sides of the existing mirror.

4,892,401

AUXILIARY SIDE VIEW MIRROR MODULE

John H. Kittridge, and Suzanne Nellett, both of 1063 Genella St., Pontiac, Mich. 48054

Filed Mar. 10, 1989, Ser. No. 321,873
Int. Cl.[4] G02B 5/10
U.S. Cl. 350—626 **9 Claims**



1. An auxiliary mirror module for extending the viewing area of an automotive side view mirror of the type mounted in a housing, said housing being mounted on a support bracket configured to be attached to the exterior of a vehicle, said module comprising:

an elongated planar casing;

a pair of opposed channel sections supported on the casing, said channel sections being separated by a distance substantially equal to a dimension between opposed edges of the side view mirror housing so that the casing may be supported on said housing by sliding the channel sections over said opposed edges of the housing so that one of the ends of the casing extends laterally outward from the vehicle;

an auxiliary mirror supported on the casing at said laterally extending end so as to be supported alongside and substantially co-planar with the side view mirror housing; and

a threaded fastener supported on the casing at a location removed from said channels and adapted to engage said side view mirror support bracket to retain the casing relative to the side view mirror housing.

4,892,402

METHOD FOR MAKING CONTACT LENS HYDROPHILIC

Takeyuki Sawamoto, Tokyo; Koichi Ishida; Niro Tarumi, both of Akishima, and Tetsuro Izumitani, Hino, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,472
Claims priority, application Japan, Apr. 30, 1987, 62-107563
Int. Cl.[4] B05D 3/06
U.S. Cl. 351—160 H **6 Claims**

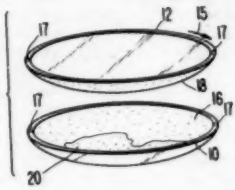
1. A method for making contact lens hydrophilic, which comprises contacting a contact lens with a treating solution containing a hydrophilic monomer, at least one photosensitizer selected from aromatic ketones or quinones, and a solvent, and thereafter irradiating said contact lens with ultraviolet light.

4,892,403

COMPOSITE PLASTIC LENS AND METHOD OF MAKING THE SAME

Joseph Merle, Miami, Fla., assignor to Opticast International Corporation, London, England

Filed Aug. 19, 1988, Ser. No. 234,090
Int. Cl.[4] G02C 7/02, 7/06
U.S. Cl. 351—168 **18 Claims**



1. A lens for an eyeglass comprising:

an anterior plastic lens having a first corrective feature;

a posterior plastic lens having a second corrective feature;

said anterior and posterior lenses joined together by an adhesive that bonds opposing, etched surfaces of said anterior and posterior lenses; and

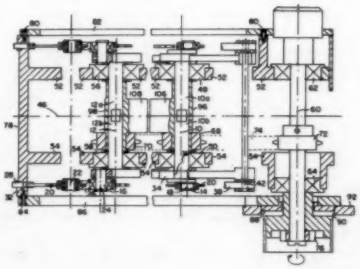
wherein said lenses, when joined, form a prescription lens incorporating said first and second corrective features.

4,892,404

FILM TRANSPORT MECHANISM FOR A MOTION PICTURE CAMERA

Otto Blaschek, Aschheim, Fed. Rep. of Germany, assignor to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG, Munich, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,119
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643594
Int. Cl.[4] G03B 1/22
U.S. Cl. 352—192 **11 Claims**



1. A film feed mechanism for a motion picture camera to advance film in a travelling plane, the film having first and second rows of perforations, comprising:

first and second feeding claws respectively having tips for engaging the perforations on the film, said first feeding claw being disposed on one side of a center plane for engagement with the first row of perforations of the film which is to be fed in steps past a picture window of the camera, and said second feeding claw being disposed on the other side of the center plane for engagement in the second row of perforations of the film;

first and second transporting drives for respectively driving said first and second feeding claws so that said tips tra-

verse an elongate, closed curve which has an end which enters into the travelling plane of the film and has another end which leaves the travelling plane of the film,

first and second drive shafts which are respectively in driving connection with said first and second transporting drives;

first and second bearings for mounting said first drive shaft, and third and fourth bearings for mounting said second drive shaft, said first and second bearings being mounted on each end of said first shaft, said third and fourth bearings being mounted on each end of said second drive shaft, said bearings for each of said first and second shafts being disposed closer to the center plane of the film feed mechanism than said first and second transporting drives.

4,892,405

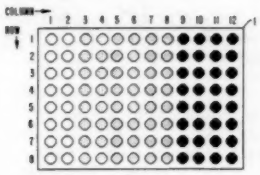
METHOD AND APPARATUS FOR PROVIDING QUALITY ASSURANCE AND CALIBRATION ASSURANCE IN A SPECTROPHOTOMETER

Keld Sorensen; James N. Macri; Timothy J. Douros, all of Oyster Bay; Paul Sajda, Commack, and Emiddio V. Ippolito, Smithtown, all of N.Y., assignors to NTD Laboratories, Inc., Carle Place, N.Y.

Filed Oct. 12, 1988, Ser. No. 256,568

Int. Cl.[4] G12B *13/00*; G01N *21/59*

U.S. Cl. 356—243 **11 Claims**



1. A quality monitoring apparatus for a photometer used to sample a plurality of samples, the photometer having at least one light source and at least one detector for generating signals corresponding to light from the samples, comprising:

a QC plate having an array of sample wells, at least some of said sample wells having different optical densities of a known value and first color between the source and detector, the array serving to position a sample well of the QC plate at each location at which the photometer samples one of the plurality of samples;

means for processing the signals generated when each density of the first color is sampled; and

means for indicating from the processed signals whether the photometer is operational.

4,892,406

METHOD OF AND ARRANGEMENT FOR MEASURING VIBRATIONS

James P. Waters, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 11, 1988, Ser. No. 142,889

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **18 Claims**

1. A method of measuring the movement of a predetermined zone of a surface of a vibrating object, comprising the steps of:

generating a laser beam having a predetermined coherence length;

separating the laser beam into a probe beam and a reference beam;

delaying the reference beam relative to the probe beam by a predetermined time interval sufficient for the probe beam to travel through a predetermined distance at least corresponding to the coherence length;

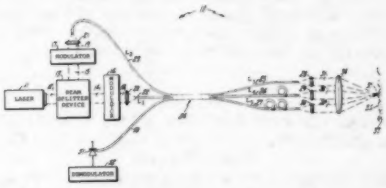
combining the thus delayed reference beam with the probe beam to form a combination beam;

subdividing the combination beam into a plurality of substantially equal component beams;

conducting each of the component beams along a separate path to a separate associated location spaced from the predetermined zone substantially by one-half of the distance traveled by light in said predetermined time interval between the respective associated location and the predetermined zone;

reflecting a predetermined portion of each of the component beams at the respective associated location back into the respective path;

directing the remainder of each of the component beams from the respective associated location to the predetermined zone for return from the predetermined zone at



least predominantly back toward the respective associated location, in the form of a speckle pattern including dark speckles which may be situated at least at one but not at all of said associated locations, and into the respective path with attendant coherent interference of the probe beam part of the thus returned remainder of the respective component beam with the reference beam part of the predetermined portion of the respective component beam resulting in a return light beam modulated in dependence on the movement of the predetermined zone relative to the respective associated location except when one of the dark speckles coincides with said associated location; and

concurrently demodulating all of the return light beams to obtain from those of them that are unaffected by the dark speckles an indication of the movement of the predetermined zone.

4,892,407

OPTICAL MEASURING APPARATUS FOR USE ON MACHINES

David R. McMurtry, Wotton-under-Edge, and Raymond J. Chaney, Berkeley, both of United Kingdom, assignors to Renishaw plc, United Kingdom

PCT No. PCT/GB87/00470, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00327, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 3, 1987, Ser. No. 159,592

Claims priority, application United Kingdom, Jul. 5, 1986, 8616431

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—375 **18 Claims**

1. Optical measuring apparatus for use on a machine having a first part movable along a first axis and supported on a second part movable along a second axis orthogonal to the first axis, the apparatus comprising in combination:

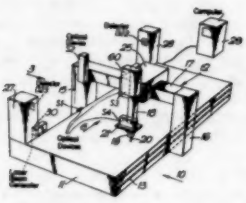
means for directing a collimated light beam towards the second machine part in a direction substantially parallel to the second axis,

a square deflector mountable on the second machine part in the path of the collimated light beam and for deflecting at least a portion of said light beam to produce a deflected beam directed substantially parallel to the first axis

measuring beam generating means mountable on the first machine part, for receiving the deflected light beam from

the square deflector and for producing therefrom at least one measuring beam, and,

detector means including at least one first detector position-



able in the path of a said measuring beam in an orientation such as to produce a signal indicative of transverse displacement of the measuring beam caused by rolling movement of the first machine part about the first axis.

4,892,408

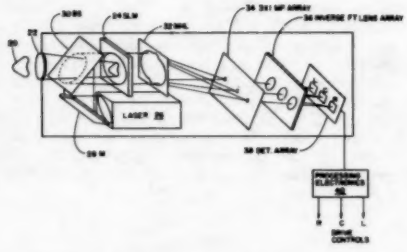
REFERENCE INPUT PATTERNS FOR EVALUATION AND ALIGNMENT OF AN OPTICAL MATCHED FILTER CORRELATOR

Benjamin J. Pernick, Forest Hills, and Michael A. Nowak, East Northport, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 3, 1988, Ser. No. 163,530

Int. Cl.[4] G01B *11/27*

U.S. Cl. 356—400 **5 Claims**



1. A reference input pattern providing for evaluation and alignment of an optical instrument which optically compares an input image with optical information stored in an array of a plurality of matched filters to provide identification and aspect information about the input image, wherein an input image to be analyzed is spatially modulated onto a reference beam of radiation, and is directed onto a plurality of lenses to obtain a plurality of Fourier transforms of the spatially modulated radiation beam, and an optical memory element having an array of a plurality matched filters recorded thereon, and having the plurality of Fourier transforms incident thereon, with each matched filter comprising a Fourier transform hologram of an aspect view of an object of interest and passing an optical correlation signal in dependence upon the degree of correlation of the Fourier transform of the spatially modulated radiation beam with the Fourier transform hologram recorded by the matched filter, an inverse Fourier transform lens means receiving the optical correlation outputs of the matched filters, for performing an inverse Fourier transformation on each optical correlation output, and a detector means for detecting the inverse Fourier transforms of the optical correlation outputs, and for producing detector output signals representative of the optical correlation outputs; said reference input pattern supplying said input image to the optical instrument and providing for evaluation and alignment of said optical instrument, and comprising a two dimensional array of substantially transparent reference targets provided on a uniform dark background which provides an identifiable power spectral density distribution and autocorrelation function, for evaluation and alignment of the optical instrument.

4,892,409

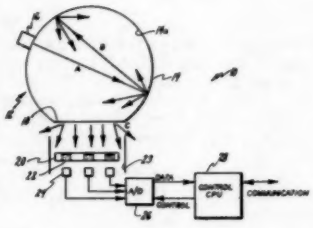
PHOTOMETRIC APPARATUS FOR MULTIWELL PLATES HAVING A POSITIONABLE LENS ASSEMBLY

Harry F. Smith, 7 Fern Lake, Newtown, Conn. 06470

Filed Jul. 14, 1988, Ser. No. 218,874

Int. Cl.[4] G01N *21/31, 21/84*

U.S. Cl. 356—414 **24 Claims**



1. A photometric apparatus for determining a characteristic of individual ones of a plurality of samples contained within a plurality of sample chambers, comprising:

an enclosure;

means for providing a substantially uniform source of radiation to said enclosure such that a plurality of sample chambers, disposed within said enclosure, are simultaneously illuminated by said uniform source means;

optical lens means, interposed between said uniform source providing means and the plurality of sample chambers, for directing radiation emanating from said substantially uniform source of radiation simultaneously into each of the sample chambers;

means, coupled to said optical lens means, for controllably positioning said optical lens means relative to the sample chambers; and

means for detecting an amount of radiation, if any, that is transmitted through individual ones of the sample chambers, said detecting means having an output signal having a magnitude which is a function of the amount of radiation, if any, which is transmitted through an individual one of the sample chambers.

4,892,410

METHOD AND APPARATUS FOR PROTECTIVE ENCAPSULATION OF STRUCTURAL MEMBERS

Richard K. Snow, Gallatin, and Milton W. Ellisor, Jr., Houston, both of Tex., assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 874,500, Jun. 16, 1986. This application Sep. 22, 1988, Ser. No. 247,950

Int. Cl.[4] E04G *21/04;* B01F *5/04;* E02D *5/60*

U.S. Cl. 366—2 **4 Claims**

1. A method of preparing and delivering a two component polymer material system separately to a discharge manifold for combining the components to initiate curing the polymer material system into a useful hardened state adjacent the desired location for use of the hardened polymer material, comprising the steps of:

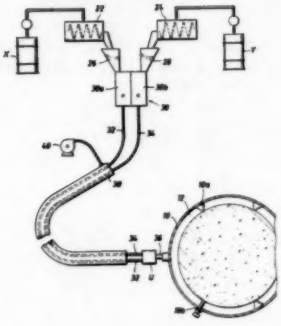
preparing a first liquid component of a two component polymer material system by mixing to blend in an granular inert filler material at a location remote from the location of use;

preparing a second liquid component of the two component

polymer material system by mixing to blend in an inert granular filler material at a location remote from the location of use;

pumping the first component under pressure through a first conduit to a discharge manifold located adjacent desired location for hardening of the polymer material;

pumping the second component under pressure through a second conduit to the discharge manifold located adjacent



the desired location for hardening of the polymer material;

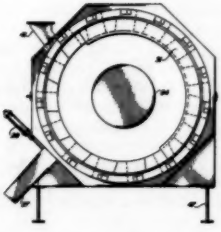
combining the first component with the second component in the discharge manifold with a static mixer to initiate the solidification reaction immediately prior to discharging the combined polymer material from the discharge manifold into the desired location for hardening use in response to the pressure provided by the steps of pumping.

4,892,411

ASPHALT MIXER APPARATUS AND METHOD

E. J. Elliott, Altamonte Springs, Fla.; Fred W. Prill, North Aurora, and Douglas R. Fisher, East Dundee, both of Ill.

Filed Feb. 8, 1988, Ser. No. 153,459
Int. Cl.[4] B28C 5/46
U.S. Cl. 366—25 **10 Claims**



1. Drum heating and mixing apparatus comprising:

a first cylindrical rotatable drum having a first material input in one end portion thereof and a material output at the other end thereof;

a second concentric drum mounted adjacent the material output end of the first cylindrical drum and attached thereto and having the material input from the material output of the first cylindrical drum and a material output therefrom at the other end thereof so that materials passing through the first cylindrical drum will pass into the second cylindrical drum;

a burner mounted on one end of said second cylindrical drum and extending therethrough for directing a flame into the first cylindrical drum;

a cowling mounted around a portion of the outside of said first cylindrical rotatable drum forming a passageway for air intake therearound and said cowling being connected to the burner air intake whereby heated air is fed to said burner;

means for introducing reclaimed asphaltic pavement materials into the mixing area of the second cylindrical drum; and

means for introducing liquid asphalt into the mixing area of the second cylindrical drum, whereby aggregate enters from the output end of the first cylindrical drum into the second cylindrical drum for the mixing of the liquid asphalt and reclaimed asphaltic materials;

a scavenger blower coupled between said second concentric drum and said burner for capturing smoke and particles from said second concentric drum and feeding said smoke and particles into said burner for incineration; and

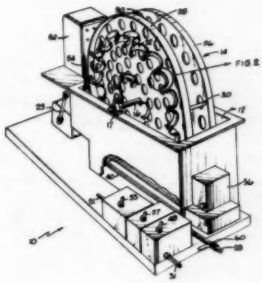
means for switching the dried heated virgin aggregates between an elevator, and said second cylindrical mixing drum.

4,892,412

HEATABLE MIXER APPARATUS

David A. Thomas, Golden; Robert F. Karr, Wheatridge, and Patricia K. Davies, Golden, all of Colo., assignors to Adolph Motors COmpany, Golden, Colo.

Filed May 9, 1989, Ser. No. 349,232
Int. Cl.[4] B01F 15/06, 9/02
U.S. Cl. 366—145 **9 Claims**



1. A heatable mixer apparatus comprising:

(a) an open-top tank wherein a liquid can be housed;

(b) a wheel means for supporting a plurality of retainer means mounted thereon for releasably holding closed vessels into which materials to be mixed can be placed, said wheel means rotatably mounted essentially perpendicularly above the tank with a portion thereof disposed within the tank;

(c) heater means for heating and regulating the temperature of liquid within the tank; and

(d) rotation means for rotating the wheel means.

4,892,413

SOUND AND VIBRATION REDUCING APPARATUS

Raj K. Vats, 11610 Perry Rd., Houston, Tex. 77064

Filed Jul. 1, 1987, Ser. No. 68,547
Int. Cl.[4] B01F 15/00; G10K 11/00
U.S. Cl. 366—349 **19 Claims**

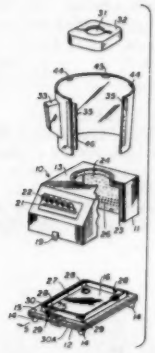
1. A sound reducing enclosure for electric blenders and other appliances of the type having a motor within a housing, a liquid containing canister removably received on the motor housing, a canister lid, and motor control buttons extending through the appliance housing for manual operation of the appliance, said sound reducing enclosure comprising;

a generally flat rigid base member having a bottom surface

with legs depending therefrom for supporting it on a flat surface and a top surface covered by a layer of sound insulating material having a centrally disposed waterproof portion peripherally surrounded by a raised rim to prevent liquid from leaking from the waterproof portion,

positioning means within the raised rim of said base member corresponding with the legs of the appliance for removably receiving and positioning the appliance on said base member,

a rigid upper body member removably hinged to said base member and having a top wall and side walls configured to substantially surround and enclose the appliance motor housing when positioned on said base member and an opening in the top wall for allowing the appliance canister to be removably received on the appliance motor housing,



a layer of sound insulating material lining the interior surfaces of said upper body member, and

one or more manipulating devices extending movably through one of said upper body side walls in alignment with the motor control buttons on the appliance housing for operatively engaging the buttons for manual operation of the appliance when it is positioned on said base member and substantially enclosure by said upper body member,

the sound insulating material of said base member and said upper body member substantially surrounding the appliance motor housing when enclosed thereby to absorb the sound and vibration emanating from the appliance and the waterproof portion and raised rim of said base member preventing leakage of liquid from the enclosure.

4,892,414

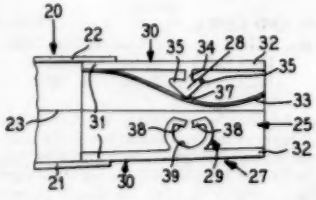
BAGS WITH RECLOSABLE PLASTIC FASTENER HAVING AUTOMATIC SEALING GASKET MEANS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Continuation-in-part of Ser. No. 214,941, Jul. 5, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 308,932

Int. Cl.[4] B65D *33/16*

U.S. Cl. 383—63 **46 Claims**



1. A bag or package having an openable mouth carrying an elongate reclosable extruded plastic zipper extending across the inside of said mouth.

said zipper having complementary profiles separably interlockable in a closed condition of the zipper; and

gasket flange means extending along substantially the full length of the profiles for separably sealingly gripping interengagement by and between said profiles in said closed condition of the zipper.

4,892,415

MINIATURE LINEAR GUIDE APPARATUS

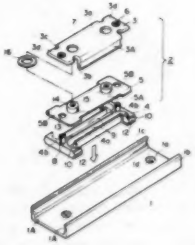
Masayuki Katahira, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,725

Claims priority, application Japan, Feb. 10, 1988, 63-16979

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—45 **3 Claims**



1. A miniature linear guide apparatus comprising a guide rail having a U-shaped cross section with a bottom plate and side walls extending outwardly therefrom, axially extending ball rolling grooves formed in the inner surfaces of said side walls, and a slider formed by integrally assembling a race member having an inverted U-shaped cross section with an upper plate and side walls extending outwardly therefrom, axially extending ball rolling grooves formed in both outer side surfaces opposing respectively said ball rolling grooves of said guide rail, a circulator fitted within a recess of said race member having ball circulating paths formed as grooves in the inside thereof, and a cap for covering said ball circulating paths, said slider loosely fitted within said U-shaped cross section of said guide rail and supported therein through many roller balls interposed between said rolling grooves of said guide rail and said race member, an improvement comprising:

a column member, having a thread hold for attaching a member to be driven, extending outwardly from a surface of said cap facing said race member, and

a through hole, formed in said race member, through which said column member passes, formed at a position corresponding to said column member.

4,892,416

PRECISION CARRIAGE AND HOUSING FOR RELATIVE POSITION SENSING DEVICE

William L. Hassler, Jr., El Toro, and Falin Shieh, Irvine, both of Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Jul. 8, 1988, Ser. No. 216,747

Int. Cl.[4] F16C *29/04, 29/08;* **G01B** *11/04*

U.S. Cl. 384—58 **15 Claims**

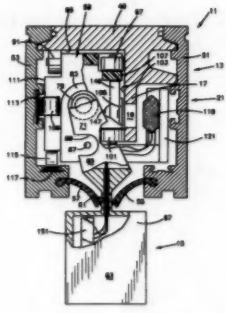
1. An improved carriage and housing for a position sensing device of the type having a carriage carrying a reader for reading the position of the carriage with respect to the housing along a position line of the device, the improvement comprising:

the housing including a rider support having first and second

planar reference surfaces and first and second spring supports; said first planar reference surface extending parallel to said position line with said first spring support extending parallel thereto and spaced therefrom, and said second planar reference surface extending parallel to the position line and approximately perpendicular to the first planar reference surface with said second spring support extending parallel thereto and spaced therefrom;

the carriage including a rider frame for riding adjacent said rider support and carrying said reader;

exactly five bearings mounted on said rider frame for supporting the rider frame with respect to the first and second planar reference surfaces of said rider support, said five bearings being disposed so that a first and second of said bearings are disposed parallel to said position line and support said rider frame with respect to said first planar



reference surface, said third and fourth bearings are disposed parallel to said position line and support said rider frame with respect to said second planar reference surface, and said fifth bearing is disposed to support said rider frame with respect to said second planar reference surface and disposed other than in alignment with said third and fourth bearings; and

first and second springs mounted on said rider frame, said first spring being disposed on said rider frame opposite said first and second bearings and bearing against said first spring support to urge said frame toward said first planar reference surface and said second spring being disposed on said rider frame opposite said third, fourth and fifth bearings and bearing against said second spring support to urge said frame toward said second planar reference surface.

4,892,417

ELASTOMERIC MOUNT FOR THRUST BEARING SHOE

John D. Spargo, and Joseph W. White, both of Annapolis, Md., assignors to The United States of America as represented by the United States Department of the Navy, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,132
Int. Cl.[4] F16C *39/04*
U.S. Cl. 384—99 **4 Claims**

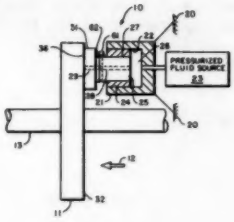
1. A bearing for applying axial thrust to a collared shaft rotating within a stationary platform, comprising:

a source of pressurized fluid;

a cell ring affixedly attached to said stationary platform, said cell ring having an internal cavity in internal communication with said source of pressurized fluid, said cavity having an internal diameter;

a piston in fluid communication with said source of pressurized fluid, said piston having an external diameter disposed radially inward from said internal diameter of said cavity within said cell ring, said piston having a portion of the length of said piston disposed concentric with said internal diameter of said cell ring;

an elongated elastomeric bearing-seal adhesively bonded between said internal diameter of said cavity of said cell ring and said concentric portion of said piston; and,



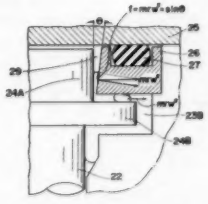
a thrust bearing shoe lockedly engaged with said piston, said thrust bearing shoe axially thrusting said collar under influence of pressure from said pressurized fluid.

4,892,418

HYDRODYNAMIC BEARING DEVICE

Takafumi Asada, Osaka; Jiro Kataoka, Hyogo, and Kouji Nakagawa, Osaka, all of Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Filed Oct. 31, 1988, Ser. No. 264,883
Claims priority, application Japan, Nov. 2, 1987, 62-277613
Int. Cl.[4] F16C *33/72*
U.S. Cl. 384—124 **9 Claims**

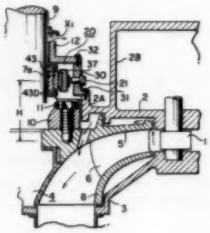


1. A hydrodynamic bearing device which comprises a shaft, a ring-shaped member having an inner peripheral face confronting an outer peripheral face of said shaft in the vicinity of its forward end and a thrust bearing member disposed in a position confronting a forward end face of said shaft, with a lubricating material being held in a gap defined by an end face of said thrust bearing member, the inner peripheral face of said ring-shaped member and the outer face in the vicinity of the forward end of said shaft, either one or both of the inner peripheral face of said ring-shaped member and the outer peripheral face in the vicinity of the forward end of said shaft being formed with a conical face having a taper to increase its diameter in a direction as it approaches said thrust bearing member.

4,892,419
LUBRICATED BEARING APPARATUS FOR HYDRAULIC MACHINERY

Hisao Inoue, Hitachi; Ichiro Hitomi, Katsuta; Osamu Sugimoto, Saita, and Teiji Horita, Hikone, all of Japan, assignors to Hitachi, Ltd., Tokyo and The Kansai Electric Co., Inc., Osaka, both of, Japan

Filed Jun. 13, 1988, Ser. No. 206,048
Claims priority, application Japan, Jun. 15, 1987, 62-147108
Int. Cl.[4] F16C *33/10, 17/02*
U.S. Cl. 384—322 9 Claims



1. A lubricated bearing apparatus for hydraulic machinery, comprising:

a runner mounted on the tip of the main shaft, an upper cover covering said runner, a bearing supporting plate that extends upwardly from said upper cover having threaded holes, adjusting screws inserted through said threaded holes, reinforcing support plates disposed in contact with said adjusting screws, bearing ceramic sliding plates mounted on said reinforcing support plates, at least one rotary-side sliding plate disposed in contact with said bearing ceramic sliding plates, and a main shaft sleeve member that is mounted on the main shaft and to which said rotary-side sliding plate is fixed, said adjusting screw being rotatable to bring said bearing ceramic sliding plates into press contact with said rotary-side sliding plate;

said rotary-side sliding plate being a rotary-side ceramic sliding plate formed of a ceramic material;

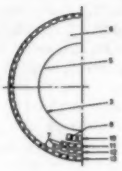
engagement portions in one side surface of said rotary-side ceramic sliding plate, at least one receiving groove in an outer peripheral surface of said main shaft sleeve member for receiving said rotary-side ceramic sliding plate, and said main shaft sleeve member having preventing portions partially extending across said receiving groove for engaging said engagement portions.

4,892,420
FRICTION BEARING FOR DEEP WELL DRILLING TOOLS

Volker Kruger, Sassengarten 8, D-3110 Celle, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 172,591
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709836
Int. Cl.[4] F16C *33/12;* E21B *4/02*
U.S. Cl. 384—420 9 Claims

1. Friction bearing for well drilling tools, with a trace ring and a bearing ring where the bearing ring has bearing segments supported on the sliding face of said trace ring and the trace ring has a bearing body with a bearing material that is hard and wear resistant, characterized by the fact that the sliding face of the trace ring is formed by a number of molded bodies countersunk so flush with the surface of the bearing body and they are arranged side by side in a mosaic pattern, with their surfaces

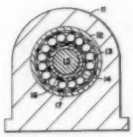


together defining a ring path that has an essentially closed surface.

4,892,421
BEARING WITH COMPOSITE LOAD BEARING SURFACES

Hofgren Jon M., 3805 NW. 16th Blvd., Gainesville, Fla. 32605

Filed Jan. 11, 1988, Ser. No. 141,954
Int. Cl.[4] F16C *27/04*
U.S. Cl. 384—492 8 Claims



1. In a bearing for a rotating shaft wherein the bearing includes a plurality of rolling members retained in free rolling relationship by an inner race mounted on said shaft and an outer race mounted on a housing supporting said shaft, the improvement which comprises incorporating between said races, and said rolling member a thin layer of fiber reinforced elastomeric material being capable of rapid and complete recovery from deflections.

4,892,422
SUPPORT ASSEMBLY FOR THE ROTOR OF AN OPEN END YARN SPINNING APPARATUS

Peter H. Stahlecker, Charlotte, N.C., assignor to American Suessen Corporation, Charlotte, N.C.

Filed Aug. 1, 1988, Ser. No. 226,673
Int. Cl.[4] D01H *1/24;* F16C *13/00*
U.S. Cl. 384—549 18 Claims

1. A support assembly adapted to be mounted in adjacent pairs to form a wedge shaped cusp for rotatably supporting a shaft of a spinning rotor of an open end yarn spinning apparatus, and comprising

a metallic support shaft defining a central axis,

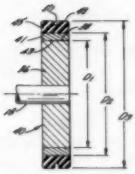
a bearing mounted on said support shaft for rotatably mounting said shaft to the frame of the yarn spinning apparatus,

a pair of discs mounted to said support shaft on respective opposite sides of said bearing, with each of said discs comprising:

(a) an annular metal body member having a central bore coaxially receiving said shaft so as to be fixedly mounted

thereto, and with said body member having an annular outer surface which is cylindrical and concentric to said central bore and to said central axis of said shaft,

(b) an annular metal ring mounted coaxially upon said outer surface of said body member, with said metal ring having an outer peripheral surface and an inner surface, with said inner surface of said metal ring being cylindrical and contacting and engaging said outer surface of said body



member so as to form a self holding and releasable press fit interconnection between said metal ring and said body member, and

(c) an annular plastic ring fixedly mounted upon said outer peripheral surface of said metal ring,

whereby said metal ring and said plastic ring of each disc may be removed as a unit from the associated body member to facilitate the replacement of said plastic ring.

4,892,423

ROTARY ACTUATOR AND FABRICATION PROCESS THEREFOR

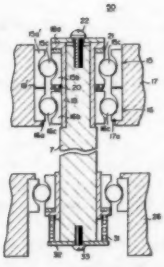
Tsuyoshi Takahashi; Katsumi Kawamura; Jun Naruse, and Jyousei Shimizu, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 943,750

Claims priority, application Japan, Dec. 23, 1985, 60-287703

Int. Cl.[4] F16C *19/10*

U.S. Cl. 384—611 **3 Claims**



1. A rotary actuator, comprising:

a rotational shaft;

a plurality of bearing sets arranged in spaced relationship along the axis of said rotational shaft to support opposite ends of said rotational shaft, each of said plurality of bearing sets including a plurality of axially arranged ball bearings having an outer ring and an inner ring which are concentric with said rotational shaft, and a plurality of balls interposed between said outer and inner rings; and

an elastic member interposed between said plurality of ball bearings and having applied thereto a force in the axial direction of said rotational shaft;

wherein said plurality of ball bearings are situated interiorly of a housing of said bearing set in the axial direction of said rotational shaft, such that under the application of an axial force, they share substantially equally component forces generated by said elastic member, wherein said elastic member intervenes in one of sets of the outer rings and of the inner rings, and the other set opposing said one set is coaxial therewith, the axial height of said other set being prolonged as compared to that of said one set so that the rings of said other set may make close contact with each other when the axial force acting to make the rings of said one set head toward said elastic member in opposition to a repulsive force generated by said elastic member intervening in said one set reaches a predetermined value.

4,892,424

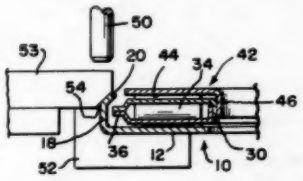
THRUST BEARING

Carl R. Christenson, Bethlehem, and Richard L. Alling, Torrington, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Sep. 29, 1988, Ser. No. 250,657

Int. Cl.[4] F16C *33/64*

U.S. Cl. 384—620 **8 Claims**



1. A thrust bearing race comprising: a radially extending annular raceway having an outer periphery and an inner periphery; a totally solid annular lip integral with and extending axially from at least one of said peripheries, said lip having an inside surface and an outside surface, and at least one stake which has been bent after being heated and having an inside surface and an outside surface, one of said stake surfaces protruding from one of said lip surfaces, the other of said stake surfaces indented from the other of said lip surfaces, each stake surface being at an acute angle with respect to the associated lip surface.

4,892,425

THERMAL TRANSFER RECORDING APPARATUS AND INK SHEET CASSETTE THEREFOR

Hiroshi Shimizu; Naohiro Ozawa, both of Yokohama; Toshihiko Gotoh, Tokyo; Kentaro Hamma, and Takeshi Nomura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,826

Claims priority, application Japan, Jan. 9, 1987, 62-1610; Feb. 13, 1987, 62-29612; Apr. 13, 1987, 62-88810

Int. Cl.[4] B41J *33/14, 32/00, 3/20*

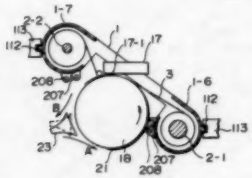
U.S. Cl. 400—120 **14 Claims**

1. A combination of a thermal transfer recording apparatus and an ink sheet cassette therefor,

said ink sheet cassette comprising a cassette case having, in a united form, a supply shaft housing section, a take-up shaft housing section and means for connecting-said sup-

ply shaft housing section and said take-up shaft housing section to each other, a supply shaft rotatably mounted within said supply shaft housing section, a take-up shaft rotatably mounted within said take-up shaft housing section, and an ink sheet having applied thereto thermal transfer ink, the ink sheet before use or new ink sheet being wound in the form of a continuous roll about said supply shaft, the ink sheet extending between said supply shaft and said take-up shaft, the ink sheet after use or used ink sheet being taken up about said take-up shaft, said supply shaft housing section having an inner diameter substantially equal to an outer diameter of the roll of the new ink sheet wound about said supply shaft, said take-up shaft housing section having an inner diameter substantially equal to said inner diameter of said supply shaft housing section; and

said thermal transfer recording apparatus comprising a chassis assembly defining a cassette loading section on which said ink sheet cassette is to be loaded, said chassis assembly having an inner chassis, drive means mounted on said inner chassis for driving one end of the respective supply and take-up shafts, and a print section having a drum and a thermal head, said thermal head cooperating with said drum to pinch therebetween a sheet to be printed and the



new ink sheet in superposed relation to effect printing on the sheet to be printed,

wherein the new ink sheet, wound about said supply shaft to a location close to an inner wall surface of said supply shaft housing section of said cassette case, is changed to the used ink sheet, the used ink sheet being wrinkled due to heating by said thermal head, the used ink sheet having an increased thickness due to the wrinkles, and wherein said take-up shaft has an outer diameter sufficiently smaller than that of said supply shaft such that, when the used ink sheet is taken up in the form of a roll about said take-up shaft, the roll of the used ink sheet entirely wound about said take-up shaft has such an outer diameter as to be out of contact with an inner wall surface of said take-up shaft housing section, to thereby prevent contact of said take-up shaft with an inner wall surface of said cassette case due to an increase in the diameter of the roll of the used ink sheet wound about said take-up shaft, whereby the distance between the outer diameter of the take-up shaft and inner diameter of the take-up shaft housing section is increased, as compared to the distance between the outer diameter of the supply shaft and inner diameter of the supply shaft housing section, without increasing the inner diameter of the take-up shaft housing section.

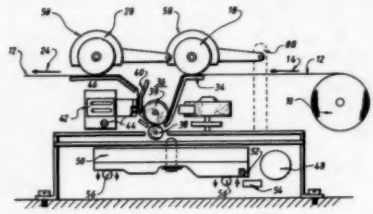
4,892,426

PAPER MOVEMENT MONITOR

David Steele, Edinburgh, Scotland, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 30, 1988, Ser. No. 213,857
Int. Cl.[4] B41J *11/64*
U.S. Cl. 400—708 **27 Claims**

1. An apparatus for monitoring movement of paper in a printer, said apparatus comprising a first movement sensor operative to engage paper in a printer at a first point and operative to detect the distance moved by the paper at said first point between successive lines of printing, said apparatus providing indication of a paper feed error if said distance of movement



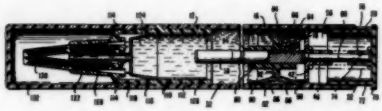
detected by said first sensor does not lie within first and second predetermined limits.

4,892,427

SEAL FOR A DOSAGE DISPENSER TUBE

John Ford, Cordova, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 75,385, Jul. 20, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 210,896
Int. Cl.[4] A46B *11/02*; A45D *40/26*
U.S. Cl. 401—182 **38 Claims**



1. A dispenser for dispensing metered portions of a viscous material, said dispenser comprising:

a cylindrical tube having an actuating axial end and a discharge end through which the viscous material may be expelled from said tube and an interior surface facing into said tube;

a rod disposed in said cylindrical tube and having a plurality of transversely extending ridges spaced along a longitudinal direction of said rod;

push button means operatively coupled to said rod for reciprocating said rod axially within said tube from a first position to a second position closer to said discharge end than said first position;

biasing means for urging said push button means and rod toward said first position;

a plunger extending around said rod and movable therealong from said actuating end of said tube toward said discharge end, said plunger extending radially from said rod to said interior surface of said tube and being effective to provide a first seal between said interior surface and said plunger and a second seal between said rod and said plunger, said plunger having a general H-shaped cross-section, for cross-sections taken along radial-longitudinal planes in said tube through said plunger, said plunger comprising an outer tubular section which sealingly contacts and is movable along said interior surface of the tube, forming said first seal, an inner tubular section which sealingly surrounds said rod and forms said second seal and a ring-shaped rib extending radially in said tube and connecting said outer and inner tubular sections to one another; and

catch means connected to said plunger and engageable with said ridges on said rod for moving said plunger, in ratchet-like manner, on said ridges of said rod in a direction toward said discharge end.

4,892,428

TIP REMOVAL DEVICE

Gerald Grötsch, Fürth, Fed. Rep. of Germany, assignor to J. S. Staedtler GmbH & Co., Fed. Rep. of Germany

Filed Oct. 27, 1987, Ser. No. 112,997

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640517

Int. Cl.[4] B43K *13/00, 9/00*

U.S. Cl. 401—258 12 Claims

1. An axially removable cylindrical holding shaft or cap for placement over and for unscrewing and removing a tip of a writing or drawing instrument, said holding shaft having a receiving bore for that instrument tip and being comprised of at least one approximately axially extending lever in a wall of said receiving bore, said lever being tiltable about an axis extending approximately tangentially to said wall, wherein said lever has an arm on each side of said axis, one of said arms forming a part of said wall and having a detent at its end, said detent projecting into said receiving bore for engaging one of a groove and an undercut of said tip when said tip is inserted in said receiving bore, fixing said tip in said receiving bore in axial direction, said detent being disengaged from said tip by means of radial pressure exerted on the other of said arms.

4,892,429

ROOF ANCHOR AND STRESS PLATE ASSEMBLY

Louis N. Giannuzzi, 59 Dingletown Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 81,016, Aug. 3, 1987. This application Jul. 5, 1988, Ser. No. 215,307

Int. Cl.[4] F16B *25/06*

U.S. Cl. 411—383 13 Claims

1. An anchor for use in either relatively soft or hard material, said anchor comprising a head and a shank having a section of predetermined length constituted by a screw terminating in a tip at the end of the shank, said screw being defined by a root which tapers toward the tip along substantially the full length of the section and a threading formed by a series of convolutions whose crests are of essentially the same diameter along substantially the full length of the section except for the convolutions thereof adjacent the tip including a final convolution in the series.

4,892,430

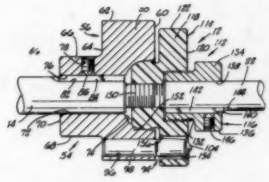
QUICK CONNECT-DISCONNECT DRIVE SHAFT COUPLING

Miroslav Liska, Northridge, and Anthony Tomsicek, Woodland Hills, both of Calif., assignors to Durotech Co., Moorpark, Calif.

Filed Nov. 14, 1988, Ser. No. 270,047

Int. Cl.[4] F16B *1/00*

U.S. Cl. 403—24 18 Claims



1. A quick connect-disconnect coupling adapted to unite on a common axis a first drive shaft of a prime mover with a second drive shaft of a piece of equipment for common rotation of said shafts comprising:

a first mating member mounted on one of said shafts, said first mating member including a socket portion and a first interlockable drive means which includes at least one side biasing, axially nonfastenable driver pin fixedly secured thereto and a part thereof projecting generally parallel to said common axis; and

a second mating member mounted on the other of said shafts, said second mating member including a ball portion removable matable with said socket portion for aligning said shafts and a second interlockable drive means matable with said first interlocking drive means in which said second interlocking drive means includes a driver bore to releasably receive said side biasing, axially non-fastening driver pin whereby movement of one of said shafts will impart movement through said first and second interlockable drive means when said mating members are biasingly engaged one with the other and movement of one of said shafts will impart movement through said interlocking drive means to said other drive shaft.

4,892,431

MOUNTING DEVICE FOR CONDUCTOR PLATES

Peter Bachmann, Karlsruhe, and Hans U. Guenther, Straubenhardt, both of Fed. Rep. of Germany, assignors to Schroff GmbH, Straubenhardt, Fed. Rep. of Germany

Filed Jan. 28, 1988, Ser. No. 149,328

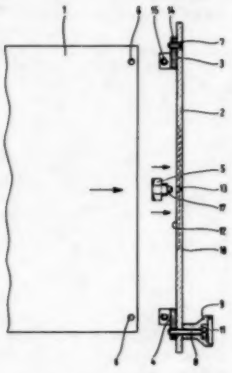
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 8701710

Int. Cl.[4] F16B *9/00*; H05K *7/00, 5/00*

U.S. Cl. 403—187 12 Claims

1. A connecting plug for providing lateral support for a circuit board in a plug-in unit intended to receive electrical and electronic components in industrial electronic devices, the plug-in unit including a front panel having a rear face, and a circuit board fastened to the rear face of the front panel and perpendicularly thereto by means of at least two holding blocks, said connecting plug comprising: a body provided on one side with at least one insertion groove for receiving a circuit board; and a plug-in pin projecting from said body at a

side opposite said one side, said plug-in being shaped to provide a press seat with a blind recess provided in a rear face of



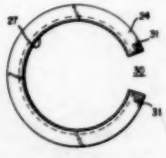
the front panel of the plug-in unit to prevent said connecting plug from dropping off the front panel.

4,892,432

CLIP FOR SECURING ROTATING PARTS

David G. Cooper, Urmston, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 11, 1988, Ser. No. 142,600
Claims priority, application United Kingdom, Jan. 24, 1987, 8724966; Jan. 31, 1987, 8702198
Int. Cl.[4] F16B *2/20*
U.S. Cl. 403—297 2 Claims



1. A clip (22) comprising a generally circular body having two ends defining a gap (30,42) in the general circle, and resilience to allow firstly a preparatory contraction in the radial cross-section, with reduction of said gap, for the introduction of the clip to a receiving position, and secondly an expansion in cross-section with increase of said gap, for the installation of the clip to a clipping position, wherein the body comprises:

a tubular web portion (27,41) and two axially spaced radially projecting flanges (23, 24; 43, 44) therefrom to enable said installation in two internal annular grooves (28);

a formation (31) towards the two ends of at least one of the flanges to enable gripping and transport by a contracting tool to the receiving position; and

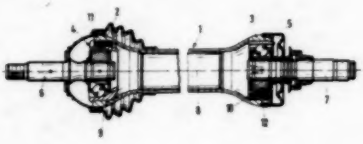
one or more holes (47) in the web portion to facilitate resilient contraction thereof.

4,892,433

PROCESS FOR PRODUCING A JOINT BETWEEN A METALLIC INNER SLEEVE AND A TUBE OF FIBER-REINFORCED PLASTIC MATERIAL AND THE RESULTING JOINT PRODUCED THEREBY

Wolfgang Schreiber, Sontra, Fed. Rep. of Germany, assignor to Volkwagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 217,640
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728978
Int. Cl.[4] B25G *3/10*
U.S. Cl. 403—359 3 Claims



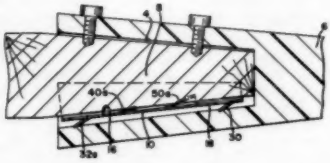
2. A joint between an inner member and a tubular region of a fiber-reinforced plastic member comprising an inner cylindrical member made of rigid material and having a knurled outer surface and a fiber-reinforced plastic member having an elastically deformable tubular cylindrical member-retaining region in mating contact with the knurled surface, the retaining region having reinforcing fibers which extend substantially entirely in the circumferential direction about the axis of the tubular retaining region and being press-fitted on the knurled outer surface of the cylindrical member so as to apply force in the radial direction to the tubular retaining region, thereby causing elastic enlargement of the tubular retaining region.

4,892,434

HANDLE BRACKET RETAINER

Drexel R. Miller, McHenry, Ill., assignor to Cotter & Company, Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 264,835
Int. Cl.[4] B25G *3/02;* F16D *1/00*
U.S. Cl. 403—361 12 Claims



1. A handle bracket retaining for retaining the end of a handle in the socket of a hand tool comprising

a one-piece body forming a curved open shell having a longitudinal axis extending from a first open end in which the handle end is inserted to a smaller second open end, said shell further having a tapered configuration from said first end to said second end to form an internal surface generally matching the exterior shape of the handle end and an outer surface generally matching the internal shape of the socket of the tool,

said body having tab means respectively being formed angularly inward from said inner surface and angularly outward from said outer surface, said tab means including a plurality of outer tabs bent extending outward from said outer surface near said first open end along respective lines connecting said plurality of tabs to said body and forming free end portions for engaging the socket, said connecting lines of said plurality of outer tabs being dis-

posed in a common plane arranged laterally to said longitudinal axis of said body, said body being capable of being at least partially positioned in said socket prior to insertion of the end of handle with said outer plurality of tabs being arranged exteriorly of said socket,

a third tab extending outward from said outer surface near said second open end along another connecting line disposed in a second plane generally parallel to said common plane, said third tab forming a free end for engaging the socket, said tab means further including at least one inner tab extending inward from said inner surface from a connecting line and forming a free end portion for engaging the end of the handle, said at least one inner tab extending inward from said inner surface in a direction relative to said longitudinal axis opposite to said direction said plurality of outer tabs extend outward from said outer surface,

said inner surface being arranged to be positioned in confronting relationship to the the end of the handle when the end of handle is inserted into said body positioned in the tool socket with said plurality of outer tabs being arranged exteriorly of the socket, and said plurality of outer tabs being snapped into contact with the internal surface of the socket upon said handle end being fully inserted into said body, and

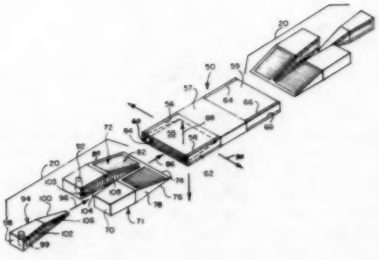
said plurality of tabs respectively acting frictionally to engage the end of the handle and the internal surface of the socket for preventing relative movement therebetween when the end of the handle is fully inserted into the socket of a tool.

4,892,435

INTERLOCKING STRUCTURAL MEMBERS EMPLOYING TRANSVERSE LOCKING DOUBLE INTERFITTING WEDGE

Robert E. Anderson, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 6, 1989, Ser. No. 306,196
Int. Cl.[4] F16B *2/14*
U.S. Cl. 403—374 **8 Claims**



5. An expansion fastener comprising:

a hollow receptacle having

(a) a first section including a wall, and

(b) at least one additional section integrally extending coaxially from the first section and having slits formed in the wall thereof; and

a double interlocking wedge received within the slitted section for expanding the slitted wall thereof, the double wedge including a first wedge member having

(a) tapered surfaces for contacting mating tapered surfaces within the wall of the slitted section,

(b) at least one tapered surface being ridged for engaging a mating ridged surface within the wall of the slitted section;

(c) an inwardly tapering recess formed therein; and

a second wedge member adapted to be driven into the recess, the second wedge member having inwardly tapering rippled sidewalls adapted to securely engage mating rippled surfaces formed in the recess;

the driving insertion of the first wedge member resulting in independent expansion of the receptacle in a first direction, and further wherein the driving insertion of the second wedge member into the first wedge member results in expansion of the first wedge member and coupled translated expansion of the receptacle in a second direction orthogonal to the first direction;

a receptacle further including still another slitted section similar to the first and integrally extending coaxially from the first section in a direction opposite that of the first additional slitted section for receiving another double wedge;

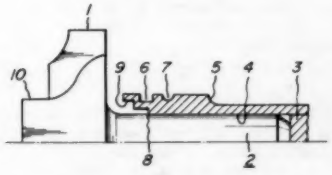
and still further wherein two opposite vertically tapered surfaces of the wedge are ridged for engaging mating ridged surfaces in the wall of the slitted section.

4,892,436

SHAFT COMPOSITE STRUCTURE BETWEEN CERAMIC TURBINE ROTOR AND METAL MEMBER

Takeyuki Mizuno, Toyohashi, and Seiichi Asami, Okazaki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 24, 1988, Ser. No. 172,378
Claims priority, application Japan, Mar. 30, 1987, 62-45875[U]
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—404 **10 Claims**



1. A shaft composite structure wherein a ceramic shaft integrally formed on a ceramic turbine rotor is coaxially fixed to a metal sleeve integrally formed on a metal rotary shaft of a compressor impeller, comprising a connection edge formed on said metal sleeve in contact with said ceramic shaft, said edge being located at a position in substantial alignment with a recess arranged on an outer surface of said metal sleeve, such that said edge and said recess are arranged substantially in a radial plane which outwardly extends perpendicularly from the axis of said ceramic shaft and said metal sleeve, and a tip portion of said metal sleeve axially spaced from said connection edge and radially spaced from said ceramic shaft, wherein said tip portion has a thickness within a range of about 0.5 mm to 1.5 mm and a portion of said metal sleeve which includes said connection edge has a thickness of greater than about 1.5 mm.

4,892,437

CONCRETE FINISHING FLOAT WITH REAR FITTING BAR

Simon Kraft, 7501 W. 99th Ter., Overland Park, Kans. 66212

Filed May 23, 1988, Ser. No. 197,279
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—97 **8 Claims**

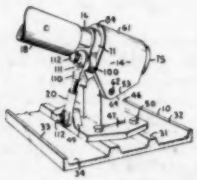
1. A tilting mechanism for an elongated concrete finishing float having a forward edge and a rear edge, comprising:

(a) support means adapted for mounting on said float; said support means having an upper portion and a lower portion, a hinge connecting said support means upper portion to said support means lower portion for tilting motion

therebetween along an axis running generally parallel to the longitudinal axis of said float;

(b) an elongated shaft, rotatable connecting means for connecting said shaft to said support means upper portion whereby said shaft extends generally transversely and rearwardly of said float; and

(c) a link having a first end and a second end, said link first end being adapted for pivotal connection to said shaft at a position spaced rearwardly from said rotatable connecting means; said link second end being adapted for pivotal connection below and rearwardly of said hinge for movement with said support means lower portion;



(d) stop means which are associated with said hinge means; said stop means comprising inclined stops abutting each outer side of said support means lower portion; said inclined stops having upper stop surfaces; said support means upper portion having lower stops surfaces for stopping engagement with said upper stop surfaces; and

(e) whereby rotational movement of said shaft produces tilting between said support means upper and lower portions which translates into tilting motion of said float with respect to said shaft.

4,892,438

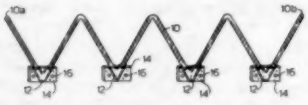
SCREED CONSTRUCTION AND METHOD

Donald R. Morrison, 9827 Mt. Holly Rd., Rte. 6, Box 634, Charlotte, N.C. 28208

Filed Dec. 30, 1988, Ser. No. 292,269

Int. Cl.[4] B28B *1/08*; E01C *19/40*

U.S. Cl. 404—119 **4 Claims**



1. A frame side construction for a portable vibrating concrete screed having a pair of screed blades on an open frame of triangular cross section comprising:

(a) a rod-tube assembly, comprising:

(i) a single continuous metal frame rod bent back and forth in a zig-zag configuration so as to define plural lower and upper bent portions connected by straight portions of the rod and terminating with upper rod ends; and

(ii) a plurality of loosely fitted tubular metal sleeves mounted on and correspondingly bent on each lower bent portion of the screed frame, said bent frame rod extending for a selected portion of the length of the screed;

(b) a metal ridge member forming the apex of the portion of the screed frame corresponding to the effective length of said rod-tube assembly, each of said upper bent portions and the upper terminal ends of said rod being welded to said ridge member;

(c) a screed blade corresponding in length to the length of said rod-tube assembly and comprising one of a pair of screed blades for the screed in which said frame side construction is to be employed;

(d) a plurality of metal plate welded to each of said tubular metal sleeves on said lower bent portions and positioned for being secured to said screed blade; and

(e) means joining each of said metal plates to said screed blade to form a frame side for a portable vibrating concrete screed intended to use said frame side.

4. The method of fabricating a side frame member for a portable vibrated concrete screed comprising the steps of:

(a) locating a plurality of spaced apart tubular metal sleeves on a single length of continuous metal rod intended for service as a side member of a screed frame;

(b) bending said continuous metal rod in a back and forth, zig-zag configuration with selected bends in the rod coinciding with the locations of the said tubular metal sleeves such that each sleeve and the portion of the rod within each said sleeve are bent together; and

(c) securing the tubular metal sleeves tubes and terminal ends of the rod to other metallic members forming part of the frame in which the frame member is installed.

4,892,439

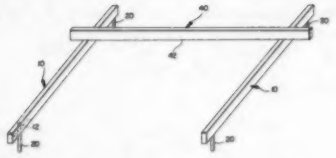
SCREED RAIL SYSTEM

Edward D. Kiefer, Fort Collins, Colo., assignor to Gerald M. Kiefer, Fort Collins, Colo., a part interest

Filed Mar. 9, 1989, Ser. No. 321,634

Int. Cl.[4] E01C *19/22*

U.S. Cl. 404—119 **11 Claims**



1. A screed rail system for leveling concrete to provide a planar top surface, said system comprising:

(a) a first pair of upright spaced-apart grade pins having upper ends supported in a manner such that said upper ends define a grade above a support surface which is to be covered with concrete;

(b) a second pair of upright spaced-apart grade pins having upper ends supported in a manner such that said upper ends define a grade above said support surface;

(c) first and second elongated screed rails each comprising an elongated tubular member having a rectangular cross-section and including upper and lower edges and first and second end portions; wherein said upper edge defines a straight edge along the length of said screed rail; and wherein said lower edge includes an elongated slotted opening in each of said end portions;

(d) an elongated leveling rod having a lower portion which defines a straight edge;

wherein said first screed rail is supported on said first pair of spaced-apart grade pins, said grade pins extending into said slotted openings in said lower edge of said first screed rail; wherein said second screed rail is supported on said second pair of spaced-apart grade pins, said grade pins extending into said slotted openings in said lower edge of said second screed rail; wherein said leveling rod is supported on said first and second screed rails in a manner such that said lower portion of said leveling rod defines a planar surface as said leveling rod is drawn along the length of said screed rails.

4,892,440

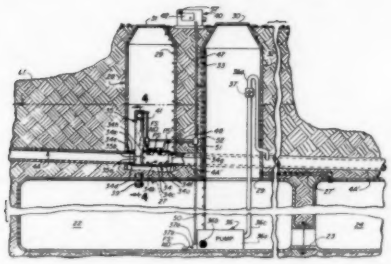
WATER BACKUP PREVENTING SYSTEM AND MONITORING SYSTEM THEREFOR

Patrick Regan, Chicago, Ill., assignor to Eveready Flood Control, Elmwood Park, Ill.

Filed Jul. 5, 1988, Ser. No. 215,545

Int. Cl.[4] E03F *1/00*

U.S. Cl. 405—36 **28 Claims**



1. A water backup preventing system for a given area having a ground buried sewer line for receiving rain and other water, the sewer line being incapable of carrying without backup thereof a given flow rate of water, the sewer line being provided at a given point therealong with at least one overflow opening into which opening water which cannot be handled by the sewer line will rise and overflow, water storage tank means below said sewer line and into which the overflow water from said opening will drain and be temporarily stored, said storage tank means having a volume to store water which cannot otherwise flow in said sewer line, pump means in the bottom portion of the storage tank for pumping water into a downstream portion of said sewer line, and pump control means for the pump means for preventing the operation of said pump means when a water backup condition exists in said sewer line and for automatically rendering said pump means operative when such condition disappears from said sewer line, so that the storage tank means can be substantially emptied and accommodate overflow conditions caused by a subsequent rainstorm.

4,892,441

APPARATUS AND A METHOD FOR DISTRIBUTING CONCRETE AND SIMILAR MATERIALS TO SELECTED POINTS OF USE

Rudolf Riker, Memmingen, Fed. Rep. of Germany, assignor to Messrs. Stetter GmbH, Dr. Karl-Lenz-Str., Memmingen, Fed. Rep. of Germany

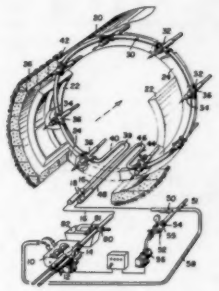
Filed Mar. 24, 1989, Ser. No. 328,248

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811585

Int. Cl.[4] E21D *11/00*

U.S. Cl. 405—146 **21 Claims**

1. A concrete distributing apparatus for tunnel lining comprising a supply conduit extending in longitudinal direction within the tunnel, one end thereof connected with a concrete pump and the other end connected with at least one intermediate conduit extending at least partly along a perimeter of the terminal and substantially in a radial plane of the tunnel, a plurality of branch pipes branching off said intermediate conduit at a plurality of branch points and leading into mould portions respectively, the plurality of branch points arranged in series in series one behind another in spaced relationship along the intermediate conduit, a plurality of valves, each one provided in one of the plurality of branch pipes, close to the intermediate conduit, each one of the plurality of branch pipes consisting of a short tube, each one of the plurality of valves comprising a plug having a length at least as that of the short tube, and a diameter as an inner diameter of the tube, the plug arranged for displacement from a closed position within the tube into an open position, in which it is received in a rearward



extension of the short tube to connect the tube with at least an incoming part of the intermediate conduit whereas in the closed position of the plug the tube being completely filled by the plug and blocked against the intermediate conduit.

4,892,442

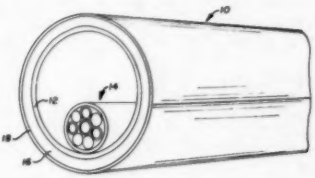
PRELUBRICATED INNERDUCT

John Shoffner, Middlesboro, Ky., assignor to Dura-Line, Middlesboro, Ky.

Filed Mar. 3, 1987, Ser. No. 21,237

Int. Cl.[4] F16L *1/00*

U.S. Cl. 405—154 **10 Claims**



1. A relatively flexible coextruded plastic tube for slidably receiving and providing a protective housing for a cable, said tube consisting essentially of a pair of telescopically related inner and outer cylindrical portions, said inner portion being formed from a highly lubricous polymeric material to provide a permanently lubricated inner surface for the tube which has a low coefficient of friction to enable substantially low friction placement of the cable therewithin and said outer portion being formed from a high tensile strength polymeric material for maintaining the structural integrity so that a protective housing is defined for the cable by the tube.

4,892,443

CABLE PLOW

Dieter Kunze, Neuried, and Peter Lancier, Wolbeck, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,535

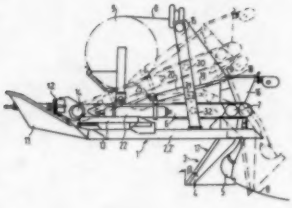
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 8709260[U]

Int. Cl.[4] F16L *1/04*

U.S. Cl. 405—164 **6 Claims**

1. In a cable plow composed of a chassis which moves over a surface which is to be plowed and provided with a cable, a swivel arm pivotably connected to the chassis at one end by a

first pivot connection, a plow element being pivotably connected by a second pivot connector to the other end of the swivel arm for pivoting around a second pivot point in a plane that lies parallel to the plowing direction and at right angles to a horizontal plane, said plow element being composed of a combination of plowshares and including a laying housing, and said plow element together with the swivel arm being adjustable out of a rated plowing position into a raised position, the improvements comprising said chassis having a sled frame having two sliding, parallel extending skids and a bow connecting said skids together, and said plow includes means for applying an opposing torque to force the plow element back to the rated position when pivoted around the second pivot point by striking an obstruction during plowing.



4,892,444

RESILIENT UNIT

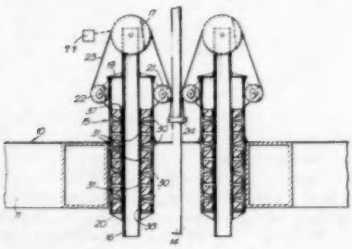
Alan F. Moore, Burbage, England, assignor to Dunlop Limited a British Company, United Kingdom

Filed Feb. 17, 1988, Ser. No. 156,577

Claims priority, application United Kingdom, Feb. 24, 1987, 8704216; Mar. 7, 1987, 8705378

Int. Cl.[4] E02D *21/00*

U.S. Cl. 405—195 **18 Claims**



1. A resilient unit comprising an inner rigid member, an outer rigid member, and an elastomeric bearing assembly interposed between said rigid members whereby said rigid members are able to move axially relative to one another in a restrained manner, said elastomeric bearing assembly comprising an axially extending arrangement of a series of annular elastomeric elements which each alternate with and are bonded to respective support means of a series of rigid support means with a plurality of elastomeric bearing units arranged to be loaded in series and to deform in shear thereby to provide said restrained relative axial movement of the rigid members in response to applied axial load said series of rigid support means comprising a series of outer rings alternating with inner rings, the outer being bonded to radially outward portions of the elastomeric elements and the inner rings being bonded to inner portions of said elements.

4,892,445

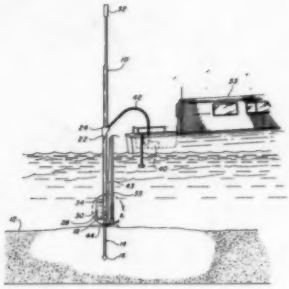
MAN PORTABLE SHALLOW WATER STRUCTURE

Marshall A. Paige, Pass Christian, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1987, Ser. No. 54,354

Int. Cl.[4] E02D *5/74*

U.S. Cl. 405—224 **7 Claims**



1. A man portable surface piercing tide measurement system support structure that is highly stable and can easily be installed in shallow coastal waters from a small boat without diver intervention, the combination comprising:

a foundation to be installed in the ocean bottom;

a separable mast coupled to said foundation;

each of said mast and said foundation being man-portable;

said mast being hollow and hacing a latch and release mechanism internal thereto located at the junction of said mast and said foundation;

a keyed messenger being configured to slide inside said hollow mast and to exert an inward and horizontal force upon said latch and release mechanism,

said latch and release mechanism being responsive to the inward horizontal force of said keyed messenger to be activated when said keyed messenger is lowered down said hollow mast from the surface of the ocean to engage said latch and release mechanism.

4,892,446

GROUP CONTROL MEANS FOR HYDRAULIC MINE-ROOF SUPPORTS

Andreas Rachel, Wuppertal, Fed. Rep. of Germany, assignor to Herman Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 299,003

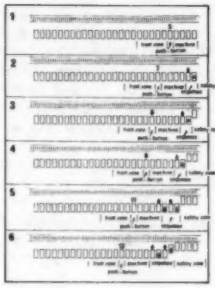
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801593

Int. Cl.[4] E21D *15/44*

U.S. Cl. 405—302 **4 Claims**

1. A group control means for a hydraulic self-advancing support in a high-output longwall comprising face support units which are electro-hydraulically controlled in groups in accordance with the position of the mining machine and which operate automatically in the sequence of prop drawing, advancing and setting, characterised in that a sequence zone, the extent of which is adapted to be influenced by the cutting speed of the mining machine, is formed behind the mining

machine, and individual support units therein carry out the sequence simultaneously and continuously and in dependence



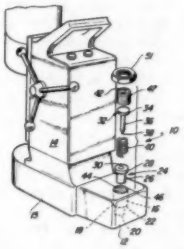
on one another, the roof being supported by at least each second support unit.

4,892,447

TORQUE RESTRAINING DEVICE FOR DRILL WITH SELF-ATTACHING BASE

John Schmidt, Palm Harbor, Fla., assignor to Everett D. Hougen, Flint, Mich.

Filed Feb. 8, 1988, Ser. No. 153,686
Int. Cl.[4] B23B *47/00*
U.S. Cl. 408—76 **30 Claims**



25. A magnetic base drill having a torque restraining device, said magnetic base drill including an electromagnetic base having a generally flat bottom surface, a drill mounted on said magnetic base, energizing means for energizing said electromagnetic base electromagnetically adhering said bottom surface to a ferromagnetic work surface, and a torque restraining device operatively mounted on said base spaced from said drill to resist torque generated by said drill, said torque restraining device comprising:

a penetrating member operable fixed to said base having a free end extending below said bottom surface, said penetrating member free end having a relatively sharp piercing surface for penetrating said work surface when said electormagnetic base is energized;

a protective sleeve telescopically mounted on said penetrating member having a free end telescopically extensible below said penetrating member free end; and

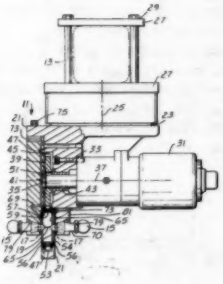
means moving said protective sleeve toward said work surface to raise an adjacent portion of said magnetic base and said penetrating member free end from said work surface enclosing and protection said penetrating member free end and for permitting retraction of said protective sleeve upon contact with said work surface and the energizing of said electromagnetic bas to expose said penetrating member free end for penetration into said work surface said energizing means energizing said electromagnetic base drawing said base bottom surface into magnetic contact with said work surface, retracting said sleeve free end against said work surface and telescopically retracting said sleeve and driving said penetrating member free end into said work surface.

4,892,448

CUTTER AND DRIVE GEAR ASSEMBLY FOR DRESSING WELDING ELECTRODE TIPS

Norman J. Hoch, 1748 Wiltshire, Berkley, Mich. 48072, and Arno Rabin, 629 Snowmass, Rochester Hills, Mich. 48309

Filed Aug. 23, 1988, Ser. No. 235,217
Int. Cl.[4] B23C *3/12*; B23K *11/30*
U.S. Cl. 409—181 **12 Claims**



1. A cutter and gear assembly for simultaneously dressing a pair of spaced aligned welding electrode tips comprising:

a housing;

a power-rotated hollow gear journaled upon said housing for rotation upon a first axis;

said gear having an axial bore arranged upon said axis, said bore at one end terminating in an annular seating flange, and at its other end extending outwardly of said gear, and adjacent its other end having an annular groove;

there being a plurality of angularly spaced peripheral drive grooves and ridges within said gear extending from said flange along said bore;

a unit dressing tool cutter assembly axially nested within said gear bearing against said seating flange and having a plurality of axially elongated arcuate drive tangs nested within said drive grooves and ridges;

a snap ring anchored within said annular groove and retainingly engaging said cutter assembly for rotation with said gear upon said axis;

said cutter assembly including a pair of symmetrical outwardly opening cutting elements on its opposite sides, each cutting element including a plurality of angularly related inclined cutting edges having a profile corresponding to the contour of a pair of aligned electrode tips axially projected into and against said cutting elements upon said first axis.

4,892,449

RELEASABLE FASTENER WITH GAUGE, AND METHOD

Malcolm A. Croxton, Lomita, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Mar. 1, 1988, Ser. No. 162,726
Int. Cl.[4] F16B *13/06*; G01B *5/00*
U.S. Cl. 411—54 **10 Claims**

1. A releasable fastener with thickness gauge for use in positioning the aligned holes of overlaid workpieces for temporarily fastening them together while simultaneously gauging and reading out the combined thickness of such workpieces at

the aligned holes from the front side to the back side thereof, comprising:

an elongate body having first and second ends and a bore opening therein from said first end to said second end,

means surrounding the bore opening at the first end for forming a work contact surface for reproducibly contacting the workpieces on the front side,

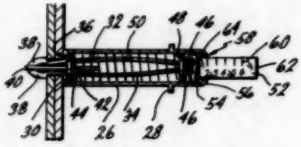
a pair of laterally expandable elongate pins disposed in and captured in the bore for sliding movement between extended and retracted positions,

each pin having a working engaging radially outwardly facing shoulder,

spring means for biasing said pins toward each other,

spreader means interposed in a fixed position between the pins and having a limited length so that when the pins are extended beyond the spreader means, they are biased by the spring means into a smaller lateral extent than when retracted over the spreader means,

plunger and gauge means mounted in said bore for movement in the bore in contact with the end of said pins remote from the work engaging shoulder for moving said pins from a normally retracted position into a projected position extending outwardly through said first end and work contact surface,



said plunger and gauge means extending in coaxial alignment outwardly from the second end of the body an amount proportional to the position of the pins,

said plunger and gauge means including means forming a scale thereon,

means located in the second end of the body for reading said scale,

said scale being referenced to said reading means to show depth of pin position relative to the work contact surface at the first end of the body and thus the thickness of interposed workpieces,

means on the body adapted to be gripped to allow movement of the plunger and gauge means and pins between a retracted position and an extended position for being inserted through the aligned holes in the workpieces, which, when then retracted, causes the pins to move over the spreader with their shoulders engaging the back side of the workpieces, with the work contact surface of the fastener body contacting the front side of the workpieces, and

compression spring means disposed in said bore and about said pins and abutting interiorly at the first end of the body and at the internal end of the pins for urging the pins into retracted position.

4,892,450

FASTENING ELEMENT CONSISTING OF A TIE BOLT AND A CLAMPING WEDGE

Anton Gerhard, Nuernberg, Fed. Rep. of Germany, assignor to "Toge-Dubel" A. Gerhard Gmbh, Nuernberg, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,928

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709361

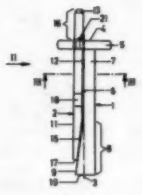
Int. Cl.[4] F16B *13/04*

U.S. Cl. 411—78 **11 Claims**

1. A fastening element comprising a tie bolt (1) having a front end (10) and a rear end (4), and a clamping wedge (2) having a front end (17) and a rear end (13),

said tie bolt (1) having an annular flange provided in said rear end (4), said annular flange (5) having an open passage (19) for receiving therein said clamping wedge (2), said tie bolt (1) having a frontal area (8) provided with a wedge face (9) which is inclined from said front end (10) to said rear end (4) in the direction of a central longitudinal axis (3) of said tie bolt (1), said tie bolt (1) having an adjoining face (6) extending generally parallel to the central longitudinal axis (3) and reaching as far as said rear end (4),

said clamping wedge (2) having a contact face (12) and an outer face (11), said clamping wedge (2) —in its non-extended state —complementing said tie bolt (1) to form an approximately cylindrical shape with said contact face (12) on said adjoining face (6) and with said clamping wedge (2) having an expansion face (15) on said wedge



face (9), and where said front end (17) of said clamping wedge (2) does not extend to the front end (10) of said tie bolt(1) and the rear end (13) of the clamping (2) extends beyond said annular flange (5),

said outer face (11) having a radius smaller than the radius of said open passage (19) so as to provide a gap between said open passage (19) and said outer face (11), and frictional retaining means for holding said clamping wedge (2) in its non-extended state in said open passage (19) of said flange (5), said frictional retaining means comprising protrusions (21) extending from said outer face (11) and abutting against said open passage (19) of said flange (5) when said clamping wedge (2) is in its non-extended state, the smaller radius of said outer face (11) relative to the radius of said open passage (19) providing free play after said clamping wedge (2) is pushed in the direction of said front end (10) of said tie bolt (1) to the extent that said protrusions (21) no longer abut said open passage (19).

4,892,451

APPARATUS FOR THE QUASI-CONTINUOUS TREATMENT OF SUBSTRATES

Peter Mahler, Hainburg, Fed. Rep. of Germany, assignor to Leybold-Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,087

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702775

Int. Cl.[4] B65G *49/06*; F27D *3/12*

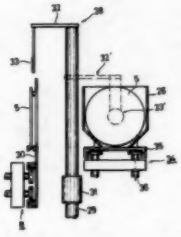
U.S. Cl. 414—217 **14 Claims**

1. Apparatus for quasi-continuous treatment, especially for the coating, of tabular substrates supplied in vertical planes in cassettes, having a system of treatment chambers and transport means for the transport of at least one substrate holder through the chambers in a transport direction and with a loading station for loading the substrate holder with one substrate at a time from the cassette and unloading one substrate at a time from the substrate holder into the cassette, characterized in that

(a) the substrate holder is equipped with projections for holding one tabular substrate at a time, by gravity alone, in a receiving plane which is at an acute attitude angle to the

vertical, said receiving plane being simultaneously parallel to the treatment chambers, and

(b) the loading station has a shifting means for shifting at least one cassette and a manipulator means disposed to extract a substrate out of the cassette and insert it into the cassette by movement parallel to the receiving plane, and



by which the substrate can be brought by a ninety degree rotation to a slanting position corresponding substantially to the receiving plane of the substrate holder, in which slanting position the substrate can be lowered onto and lifted away from the projections by said manipulator means.

4,892,452

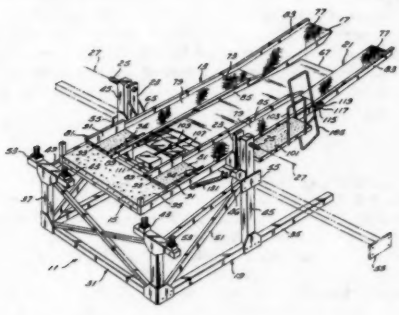
PARKING APPARATUS

John J. Moynihan, Newport Beach, Calif., assignor to GMX Parking Systems, Santa Ana, Calif.

Filed Nov. 24, 1987, Ser. No. 124,828

Int. Cl.[4] E04H *6/06*

U.S. Cl. 414—229 **28 Claims**



1. A vehicle parking apparatus, comprising:

a platform having a base and a pair of arms, said base being sized and shaped to permit a vehicle to be driven onto said base and be supported thereby, said base having a first end and a second end and said arms secured to and extending upward from said base between said ends;

a mounting device suspending said platform by said arms in a manner which permits said platform to selectively rotate about an axis in response to the force of gravity on the platform and any additional items supported thereby; and

a weight shifter supported by said platform for selectively shifting the center of gravity of the weight borne by said platform from one side of a line intersecting said axis in the direction of the force of gravity to the opposite side of said line without changing the position of said vehicle relative to said platform to permit the direction in which said platform has a tendency to rotate to be controlled.

4,892,453

APPARATUS FOR MANIPULATING EMPTY AND FILLED TRAYS FOR CIGARETTES AND LIKE ROD-SHAPED ARTICLES BETWEEN MAKING AND PROCESSING MACHINES

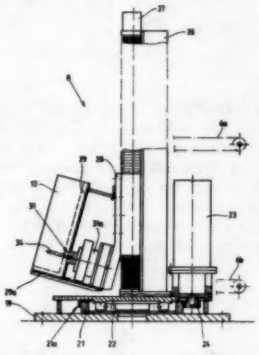
Jürgen Bantien, Hamwarde; Dietrich Bardenhagen, Hamburg, and Erich Staudte, Büchen, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 71,189

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624133

Int. Cl.[4] A24C *5/352*

U.S. Cl. 414—403 **25 Claims**



1. Apparatus for manipulating receptacles for rod-shaped articles of the tobacco processing industry, particularly for manipulating chargers for cigarettes, comprising at least one first unit for filling the receptacles; at least one second unit for evacuating articles from filled receptacles, each of said units respectively having first and second facilities for temporary storage of empty and filled receptacles; at least one magazine for temporary storage of at least one receptacle; and means for transferring receptacles between said units as well as between said magazine and at least one of said units, including a support, a carriage mounted on said support for movement between a plurality of different levels and for angular movement between a plurality of different positions with reference to a substantially vertical axis, means for moving said carriage, a holder for receptacles on said carriage, and means located on said carriage for advancing receptacles between said holder on the one hand and said facilities and said magazine on the other hand.

4,892,454

REFUSE COLLECTING VEHICLE

Hans-Jurgen Behling, Hanover, and Friedrichwilhelm Schmadeke, Neustadt, both of Fed. Rep. of Germany, assignors to Schorling GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,939

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811716

Int. Cl.[4] B65F *3/20*

U.S. Cl. 414—406 **7 Claims**

1. A refuse-collecting vehicle comprising: an undercarriage;

a driver's cabin mounted on a forward portion of the undercarriage;

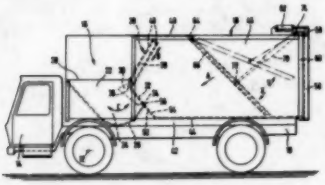
a refuse-collecting bin mounted on the undercarriage rearwardly of the driver's cabin, said refuse-collecting bin having sidewalls and a top portion;

a refuse-charging system for conveying refuse into said refuse collection bin;

a means associated with said vehicle for picking up refuse

receptacles and for emptying said refuse into said refuse-charging system;

a refuse-compacting means forming part of said refuse-charging system mounted forwardly of said refuse-collecting bin for moving refuse rearwardly into said refuse-collecting bin;



at least one counterpressure plate pivotally mounted on said top portion of said refuse-collecting bin a predetermined distance rearwardly of said refuse-compacting means; and

a means for pivoting said at least one counterpressure plate forwardly so that the pressure applied to said refuse by the rearward movement of said compacting means is increased by the forward positioning of said counterpressure plate to provide a uniform compaction of said refuse.

4,892,455

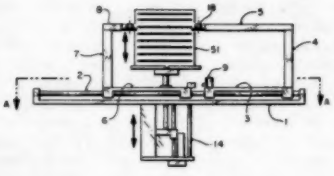
WAFER ALIGNMENT AND TRANSPORT MECHANISM

Derek L. Hine, 5 Hawk View, Portola Valley, Calif. 94025

Continuation of Ser. No. 52,496, May 21, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,207

Int. Cl.[4] B65G *1/06*

U.S. Cl. 414—417 **9 Claims**



3. Apparatus which is suitable for transporting an individual silicon wafer which is in the form of a generally circular disk having a plane, a periphery, and a center, and which apparatus comprises

(1) a mounting frame;

(2) at least two wafer carriers which

(a) are movably mounted on the frame

(b) comprise a plurality of wafer supports, and

(c) can be moved relative to each other between (i) a closed position in which a wafer to be transported can be supported solely by contact between the periphery of the wafer and the wafer supports and (ii) an open position in which a wafer to be aligned can be passed freely between the wafer carriers;

(3) closing means which continuously and resiliently urges the wafer carriers toward the closed position, and

(4) motion-controlling means which (i) when the wafer carriers are in the open position, can overcome the force exerted by the closing means, and (ii) can be operated to permit the wafer carriers to move in a controlled manner into the closed position.

4,892,456

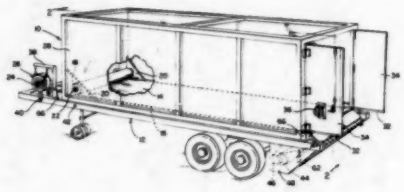
UNLOADING SYSTEM FOR FREIGHT CONTAINERS

Graham L. Hodgetts, Mars, Pa., assignor to Rolflor Industries, Inc., Warrendale, Pa.

Filed Feb. 4, 1988, Ser. No. 152,105

Int. Cl.[4] B65G *67/02*

U.S. Cl. 414—527 **3 Claims**



1. A combination of a freight container and a trailer for transporting the container over land, the combination including means for releasably securing the container on the trailer and an unloading system for removing a load from the container when secured on the trailer, through one end, namely a back end, of the container, said unloading system including a wind-up roll within the container at a forward end thereof, a load transporting belt having a forward end secured to said roll, the belt having a length at least two times the length of the container for extending along a floor of the container to the back end of the container, a drive drum on the trailer, means for releasably attaching a back end of the belt to the drive drum, means for rotating the drum to wind up the belt on the drum and thereby unload the container, and drive means on the trailer for attachable/detachable engagement with the wind-up roll for rewinding the belt thereon when the container has been unloaded, wherein the means for releasably attaching comprises strap means extending from the back end of the belt and engagable/disengagable coupling elements of the strap means and drive drum, wherein the container includes rear door means with sealing means for the strap means to extend through when the container is loaded and reel means on the exterior of the door means for storing the strap means when detached from the drive drum.

4,892,457

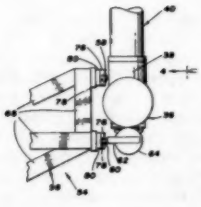
APPARATUS FOR MASTERING A ROBOT

Donald S. Bartlett, Troy; David I. Freed, Lake Orion, and William H. Poynter, Jr., Spitzley, all of Mich., assignors to GMF Robotics Corporation, Auburn Hills, Mich.

Filed Jul. 11, 1988, Ser. No. 217,304

Int. Cl.[4] B25J *9/06*

U.S. Cl. 414—735 **16 Claims**



1. Apparatus for mastering a robot including a base and an arm assembly supported for movement on the base, the robot, including the arm assembly, being movable to occupy a predetermined reference position and orientation, the apparatus comprising:

a fixture including at least one set of first, second and third mutually converging locating surfaces wherein the first surface is orthogonal to the second and third surfaces and the second surface is orthogonal to the third surface;

mounting means for mounting the fixture on the base in a fixed spatial position; and

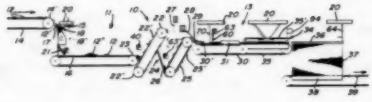
at least one member adapted to be mounted for movement with the arm assembly, the at least one member having a generally spherical surface configured to simultaneously contact each of the surfaces of at least one set of locating surfaces only when the robot is in the predetermined reference position and orientation.

4,892,458

BOARD STACKING MACHINE

Denis Proulx, Beloeil, Canada, assignor to Les Emballages P. Proulx Ltée/P. Proulx Packaging Ltd., Quebec, Canada

Filed Sep. 19, 1988, Ser. No. 245,814
Int. Cl.[4] B65G *57/18*
U.S. Cl. 414—791.6 **20 Claims**



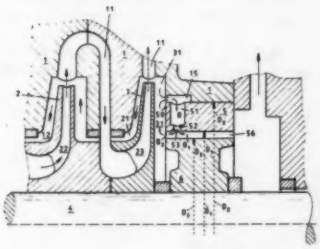
1. A board stacking machine comprising feed conveying means for feeding a plurality of boards precut to a predetermined size, feed control means for feeding a constant supply of said boards to a board orienting station; said feed control means having an accumulator displaceably secured at a discharge end of said feed conveying means for storing and releasing accumulated boards maintained in substantially horizontal alignment by stacking them onto an input end of a control feed conveyor, said feed control means having first sensing means to detect if said accumulator is accumulating boards, and second sensing means for detecting a predetermined condition of said boards at said input end of said control feed conveyor, a discharge conveyor for feeding boards from an end section of said control feed conveyor to a feed supply position of a single board feed conveyor; said board orienting station having a delivery conveyor for supporting and transporting said boards, means to orient said boards in horizontal alignment and means to position said boards in side-by-side abutting relationship on said delivery conveyor; discharging means for feeding boards to a board holding means, board arresting means actuable to prevent the discharge of boards to said board holding means; said board holding means having a pair of opposed end support members each having a board support flange, an end wall, a stop wall; a displaceable frame for moving each end support member in a horizontal and vertical direction, and a pusher member for applying downward pressure on a top surface portion of a board layer supported between said end support members, stacking means for stacking said boards in a squared bundle, said stacking means including said board holding means for supporting a predetermined number of said boards oriented side by side in a board layer thereon and for positioning said predetermined number of boards on a vertically displaceable support with said boards maintained in alignment, and control means for positioning a predetermined number of board layers one on top of the other to form said squared bundle and displacing said support each time a layer is placed on said stack.

4,892,459

AXIAL THRUST EQUALIZER FOR A LIQUID PUMP

Johann Guelich, Burgstrasse 62b CH8408, Winterthur, Switzerland

Continuation of Ser. No. 922,069, Oct. 20, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,612
Claims priority, application Switzerland, Nov. 27, 1985, 5066/85-7
Int. Cl.[4] F01D *3/04*
U.S. Cl. 415—104 **18 Claims**



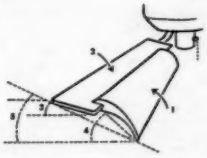
1. An axial thrust equalizer for a liquid pump comprising a dummy piston for securement to a pump rotor shaft; and a stationary sleeve spaced from said dummy piston to define an annular gap of uniform radial width therebetween, said sleeve having a plurality of ducts extending inwardly from an outer periphery to said gap to guide a flow of working liquid from a pump chamber contiguous with said sleeve and said piston into said gap, said ducts communicating with said gap to permit a delivered flow of working liquid to divide into two sub-flows with one sub-flow returning into the pump chamber to prevent rotating liquid in the pump chamber from entering into said gap wherein the ratio of the outer diameter of said sleeve to the inner diameter of said sleeve is at least 1.24:1 and the sum of the cross-sectional areas of said ducts is at least three times the cross-sectional area of said gap.

4,892,460

PROPELLER BREEZE ENHANCING BLADES FOR CONVENTIONAL CEILING FANS

Steve J. Volk, 7900 Tatum Waterway Dr., Miami Beach, Fla. 33141-1936

Filed Jan. 30, 1989, Ser. No. 303,938
Int. Cl.[4] F04D *29/38*
U.S. Cl. 416—62 **10 Claims**



1. Propeller breeze enhancing blade attachments for conventional ceiling fans wherein said auxiliary blades wedge firmly onto the trailing edges of primary fan blades to increase the angle of incidence and thus create a greatly increased dual air flow outward and downward in relation to the fan's central core; said blade attachments comprised of top and bottom surfaces, leading and trailing side edges, and inner and outer ends; configuration of said top and bottom surfaces being convex and concave respectively, with said leading edge being

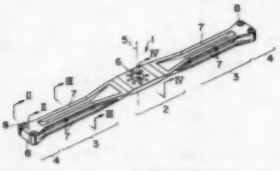
of greater depth than said trailing edge, and said outer end being of greater width and lesser depth than said inner end, with said leading edge housing the means of securing said auxiliary blades to the primary fan blades via a flexible tapered groove along said auxiliary blades' leading edge extending from their inner end to their outer end.

4,892,461

FLEXBEAM FOR ROTOR BLADES OF HELICOPTER AND METHOD FOR FABRICATION THEREOF

Tadahiro Matsumoto, and Kiyoshi Nishikawa, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 294,259
Claims priority, application Japan, Jan. 8, 1988, 63-1831
Int. Cl.[4] B64C *27/38*
U.S. Cl. 416—134 A **10 Claims**



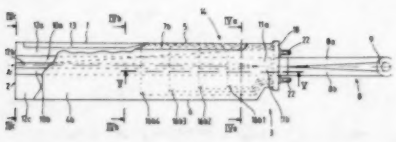
1. A flexbeam for rotor blades of a helicopter comprising:
a mast mounting and flapping part;
a feathering and lead-lag motion part integrally joined to said mast mounting and flapping part, said feathering and lead-lag motion part comprising a plate like central member made of a composite fiber material, and a pair of frame members disposed along longitudinal sides of and parallel to said central member, said frame members being made of loops of unidirectional composite fiber material and each having a Y-shaped cross section, said central member and said frame members being joined integrally along both longitudinal side portions of the central member; and
a rotor blade mounting part joined to that end of said feathering and lead-lag motion part, opposite to said mast mounting and flapping part, and adapted to be coupled to a rotor blade.

4,892,462

BLADE OF COMPOSITE MATERIALS AND ITS MANUFACTURING PROCESS

Bruno J. M. Barbier, Val d'Oise, and Jean A. Michaud-Soret, Paris, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jun. 7, 1989, Ser. No. 203,373
Claims priority, application France, Jun. 9, 1987, 87 07981
Int. Cl.[4] B64C *11/00, 27/00*
U.S. Cl. 416—226 **26 Claims**



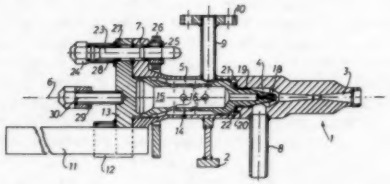
1. Blade essentially of composite materials, particularly for a multi-blade propeller of variable pitch and with individually removable blades, used in particular as the tail rotor, preferably streamlined, of a rotorcraft such as a helicopter, comprising:
a shell (4) with an aerodynamic profile, having a suction face covering (4*b*) and a pressure face covering (4*a*) that extend from the leading edge (5) to the trailing edge (6) of the blade and along which trailing edge they are connected to one another, the shell (4) comprising at least one layer of fabric of fibres with high mechanical strength agglomerated by a polymerised synthetic impregnation resin, and having an internal end formed into a blade footing (3),
a spar (8, 10*a*, 10*b*) with a longitudinal axis substantially parallel to that of the blade, and comprising at least one elongated bundle (10*a*, 10*b*) of rovings of fibres with high mechanical strength agglomerated by a polymerised synthetic resin, the largest portion of which is housed in the shell (4) and fixed by adherence of its suction face surface directly against the internal face of the opposite portion of the suction face covering (4*b*) of the shell, and an inner end portion of which, emerging from the shell (4) and passing through the blade footing (3), forms a root portion (8) flexible in torsion and flexion, arranged in a loop that surrounds, by its internal end, a single attaching socket (9), by which the blade is designed to be individually attached to a hub,
a filling (12*a*, 12*b*, 12*c*) placed in the shell (4), between the latter and the spar (8, 10*a*, 10*b*), and
a member (24) for controlling the pitch of the blade, which is integral with the blade footing (3) and designed to be mounted in rotation upon the hub about the longitudinal axis of the blade and to apply to the shell (4) a twisting moment substantially centered on the longitudinal axis of the spar, characterised in that the spar is centered on the longitudinal axis (AA) of the blade and each bundle (10*a*, 10*b*) of the spar is of a single piece, with a substantially rectangular cross-section, and also fixed, in its portion housed in the shell (4), by adherence of its pressure face surface directly to the inner face of the opposite portion of the pressure face covering (4*a*) of the shell (4), and in that the filling includes at least two filling bodies (12*a*, 12*c*), one of which (12*a*) is arranged between the spar (10*a*, 10*b*) and the leading edge (5) and the other (12*c*) between the spar (10*a*, 10*b*) and the trailing edge (6).

4,892,463

RAIL MOUNTED EJECTOR

Hans Meyer, Waldbronn, and Manfred Steegmanns, Frankfurt, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,220
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730438
Int. Cl.[4] F04F *5/00*
U.S. Cl. 417—151 **5 Claims**



1. An ejector comprising:
a pump casing having on one axial end thereof a diffuser bore and at another axial end, opposite said one axial end, an opening, said pump casing also having radial working fluid and suction connections arranged offset with respect to each other in the axial direction of said casing and a flange arranged at said another axial end of said casing;
a working fluid nozzle cooperating with said pump casing for insertion into said opening, said working fluid nozzle including at least one radial through bore in fluid commu-

nication with the working fluid connection, a cover plate and an extractor which extends towards said another axial end of said casing from said cover plate, said working fluid nozzle being inserted into said opening in said axial direction and firmly joined to said casing so as to project out of the opening, whereby said cover plate interacts with said flange of said casing such that said flange and cover plate may be screwed together by clamping bolts and whereby said extractor may be grasped by a manipulator for extracting the working fluid nozzle from the casing;

longitudinal guide means, parallel to said axial direction, for guiding said working fluid nozzle in said axial direction into said opening of said casing, said guide means including a rail arranged at said another axial end of said casing, remote from said diffuser bore, and a slide, whereby the cover plate of working fluid nozzle is held and guided along said rail to said opening by means of said slide; and further wherein the manipulator may introduce clearing means into the casing, instead of the working fluid nozzle for clearing means including a slide member adapted for engagement with the longitudinal guide means and displaceable along the same.

4,892,464

PUMP MEANS FOR SWIMMING POOLS AND SIMILAR FACILITIES

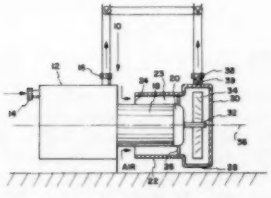
Martin T. Schydlo, Am Obersthof 25, D-4030 Ratingen 6, Fed. Rep. of Germany

Continuation of Ser. No. 907,672, Sep. 15, 1986, abandoned. This application May 6, 1988, Ser. No. 190,775

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3537039

Int. Cl.[4] F04B *23/04*

U.S. Cl. 417—201 **18 Claims**



1. A pump apparatus for supplying water and air via suitable respective feeding means to a swimming pool or similar facility, comprising a water pump, an electric motor having a casing for driving the water pump, and collecting means connected to the electric motor for pulling air over the casing of the electric motor for according contact of this air with the inner workings of the motor and the oil and grease associated therewith and for heating the air and for cooling the motor and for collecting the heated air in a chamber, the output of said collecting means being adapted to be connected to conduit means for delivering air to said water feeding means or said swimming pool,

the collecting means including a channel section means for surrounding, at least partially, the electric motor and the electric motor casing, and for forming an annular gap therebetween through which air is pulled to heat the air and to cool the motor.

4,892,465

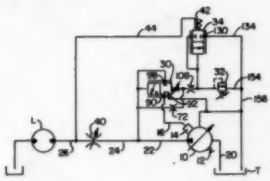
AUTOMATIC CONTROL FOR VARIABLE DISPLACEMENT PUMP

Ellis H. Born, Upper Arlington; David L. Thurston, Ashley, and Lee A. DeBoer, Worthington, all of Ohio, assignors to Hagglunds Denison Corporation, Columbus, Ohio

Filed Sep. 14, 1988, Ser. No. 244,038

Int. Cl.[4] F04B *49/08*

U.S. Cl. 417—218 **5 Claims**



1. An automatic control for a variable displacement pump having a displacement setting device movable between a maximum displacement position and a minimum displacement position, said device having a stroking piston, a first spring which acts to bias the displacement setting device to the maximum displacement position, a first fluid conduit connected to said stroking piston and adapted to receive or discharge control pressure fluid from said control to move said stroking piston and thereby vary the displacement of said pump, said automatic control comprising;

a pilot operated stroke control having a sleeve, a first port in said sleeve connected to said first fluid conduit, a spool movable in said sleeve, a control land formed on said spool which cooperates with said first port of said sleeve, a source of working pressure fluid, second fluid conduit means for connecting said working pressure fluid to one side of said control land, a case adapted to receive low pressure fluid, third fluid conduit means for connecting said pressure fluid to the other side of said land, said spool movable between a first control position in which said control land blocks said case pressure fluid from said first port and connects said control pressure fluid source to said said first port to overcome the force of said first spring and bias said stroking piston to a position of reduced pump displacement and a second control position in which said control land blocks said control pressure fluid source from said first port and connects said case pressure fluid to said first port to drain fluid from said first fluid conduit to allow said first spring to bias said stroking piston to a position of increased pump displacement with a third control position in which said control land blocks both said control pressure fluid source and said case pressure fluid from said port to substantially maintain the set pump displacement, second spring means for biasing said control spool to said second ,control, position, a first control orifice formed in said spool piston, a source of pilot fluid and fourth fluid conduit means for connecting said pilot fluid to the upstream side of said first control orifice wherein said stroke control spool will shift to said first control position when the flow of pilot fluid causes a pressure drop which overcomes the force of said second spring means;

a pilot relief valve which provides the maximum pressure setting for said pump; and

wherein said second spring means comprises a light spring having a relative low spring rate to offset the stroke control spool to said second control position and a second spring acting in series with said first spring having a relatively high spring rate, wherein said stroke control spool first overcomes said first spring force and said second spring functions to provide a high rate of change of force on the stroke control spool when the spool is moving

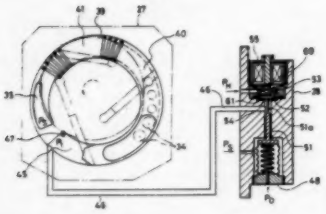
between said second control position and said first control position.

4,892,466

VARIABLE CAPACITY COMPRESSOR

Tatsuhisa Taguchi, Katano, and Yoshikazu Abe, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 20, 1988, Ser. No. 196,592
Claims priority, application Japan, May 20, 1987, 62-122913
Int. Cl.[4] F04B *49/02*
U.S. Cl. 417—295 **1 Claim**



1. A variable capacity compressor comprising:
an enclosure having cylindrical internal space, a cylindrical-shaped rotor which is rotatably held in said enclosure and driven by an external force and has vanes, plural return ports formed on a wall of volume-decrease-step space in said internal space wherein volume of sectioned space by movements of said rotor and said vanes is changed cyclically, an exit formed on said wall of volume-increase-step space in said internal space wherein volume of sectioned space by movements of said rotor and said vanes is changed cyclically, and a C-shaped guide passage formed in said wall for connecting said plural return ports and said exit;
an arc-shaped slider which is provided slidably in said guide passage for opening and closing said plural return ports with a pressure control compartment remained in said guide passage;
a bias spring for urging said slider in a direction to close said return ports; and
control pressure supply means which supplies control pressure to said pressure control compartment and comprises a pressure detecting part which compares suction pressure with atmospheric pressure, thereby to generate a displacement thereof, a valve urged to close by a spring, a rod driven by said pressure detecting part for opening said valve, and an electromagnetic coil for applying electromagnetic force to said valve, thereby to urge said valve in a direction to open.

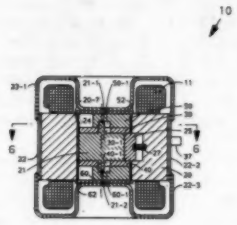
4,892,467

BALANCED ROLLING ROTOR MOTOR COMPRESSOR

James F. Crofoot, Kirkville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 12, 1988, Ser. No. 282,528
Int. Cl.[4] F04C *23/02*
U.S. Cl. 417—353 **7 Claims**

1. A rolling rotor motor means comprising:
housing means;
stator means within said housing means and having a plurality of windings and a cylindrical opening therein;
cylindrical rotor means located within said cylindrical opening and defining therewith a chamber;
said rotor means having a pair of axially extending shafts;
a pair of counterweight means in said cylindrical opening each coacting with one of said pair of shafts whereby said pair of counterweight means and said rotor means move as



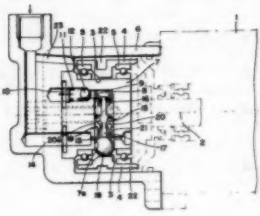
a unit responsive to the sequential actuation of said plurality of windings.

4,892,468

HYDRAULIC PUMP

Toshifumi Maehara, Hanazono, Japan, assignor to Akebono Brake Industry Co., Ltd. and Akebono Research, Development Centre Ltd., both of Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,457
Claims priority, application Japan, Aug. 24, 1987, 62-209955
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—415 **8 Claims**



1. A hydraulic pump, which comprises:
a motor;
a cylinder body having a cylinder member;
a suction portion through which an external fluid is introduced into said cylinder chamber and an ejection port through which said fluid in said cylinder chamber is ejected outward;
a cam member rotatable about an axis of rotation of said motor;
a movable member reciprocably mounted in said cylinder body and engageable with said cam member, wherein said fluid in said cylinder chamber is ejected through said ejection portion when said movable member is moved into said cylinder chamber by said cam member;
a cylindrical piston slidably fitted in said cylinder chamber of said cylinder body wherein said movable member is engageable with said cylindrical piston when said movable member is moved into said cylinder chamber to shut off communication between said cylinder chamber and said suction port, thereby sealing said cylinder chamber; and
a valve provided in said ejection passage for communication with said ejection port wherein said valve is open due to pressure in said cylinder chamber occurring when said movable member is further moved into said cylinder chamber for ejecting said fluid in said hydraulic chamber wherein said cylindrical piston comprises an inner piston

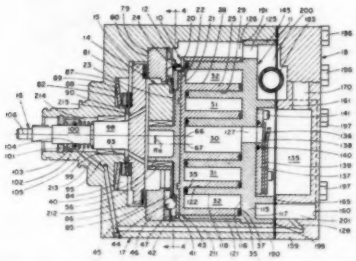
and an outer piston and wherein said inner piston is engageable with said movable member.

4,892,469

COMPACT SCROLL-TYPE FLUID COMPRESSOR WITH SWING-LINK DRIVING MEANS

John E. McCullough, Carlisle; John T. Dieckmann, Belmont, and Thomas P. Hosmer, Concord, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 3, 1981, Ser. No. 250,730
Int. Cl.[4] F04C *18/04, 29/02*
U.S. Cl. 418—55 **8 Claims**



1. In a positive fluid displacement compressor into which fluid is introduced at low-pressure through a peripheral inlet for circulation and subsequently withdrawn at high pressure through a central discharge port, the compressor comprising a housing, stationary and orbiting scroll members each having an end plate and an involute wrap of multiple turns interengaged and cooperating with each other within the housing; drive shaft means extending through the housing and rotatable about a drive shaft axis for driving said orbiting scroll member in a circular orbit with respect to said stationary scroll member about an orbital axis, the orbit having an orbit radius define as the distance between the centerline of the stationary scroll member and the centerline of the orbiting scroll member, whereby said involute wraps make moving line contacts to seal off and define moving pockets of variable volumes of different fluid pressures on both sides of said moving line contact; coupling means to maintain said scroll members in fixed angular relationship; the improvement comprising:

(a) crankplate means affixed to said drive shaft means and rotatable about the drive shaft axis;

(b) swing-link means pivotally connected to said crankplate means in torque transmitting relationship and pivotally movable relative to said crankplate means about a pivot point offset from said drive shaft axis; said pivot point following a circular orbital path about said drive shaft axis; said swing-link means extending from said pivot point and being pivotally connected to said orbiting scroll member in driving relationship to pull the orbiting scroll member in its orbital path in the same direction as the crankplate means; said pivot point of said swing-link means being located towards one side of a tangent line extending from the orbit radius of the orbiting scroll member where the centerline of the orbiting scroll member is located, and generally towards the pivot point, said one side being away from the direction of motion of said orbiting scroll member; counterweight means forming a component of said swing-link means connected to said orbiting scroll member and having a mass that generates a centripetal force with respect to the orbital axis that exactly balances the centrifugal force exerted by the orbiting scroll member and its associated structure when said orbiting member is driven about its orbital axis so that driving motion of said crankplate means through said swing-link means effects orbital movement of the orbiting scroll member and the sole radial sealing force between the wraps of the orbiting scroll member and the stationary scroll member, said sealing force being proportional to driving torque applied to the orbiting scroll member by said crankplate means;

(c) a fixed thrust plate means disposed between said crankplate means and said orbiting scroll member, said thrust plate means having a surface facing towards said crankplate means;

(d) a bearing means arranged to react and carry moment loads generated by the driving force applied by the crankplate means to the orbiting scroll member, said bearing means comprising a first thrust bearing between said crankplate means and said thrust plate surface and a second thrust bearing means on the opposite side of said crankplate means; and

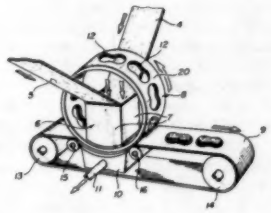
(e) means for exerting an axial force against the second thrust bearing means in a direction to urge the crankplate means against the first thrust bearing means.

4,892,470

APPARATUS FOR LAYERED FLANGED FIBROUS PAD FORMATION

Allan P. Farrington, Englishtown, and Gerald M. Marshall, Somerville, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 16, 1989, Ser. No. 311,544
Int. Cl.[4] B29J *5/00*
U.S. Cl. 425—80.1 **10 Claims**



1. In an apparatus for forming a complexly shaped product, the apparatus having at least one fiber supply means to supply opened fibers to an air stream which air stream entrains and transports said fibers to a condensing surface, the improvement comprising:

(a) a moving foraminous surface forming said condensing surface positioned to pass through said air stream substantially transversely thereto;

(b) a continuous molding loop defining at least one mold, for receiving entrained fibers from said air stream which are condensed on said foraminous surface within said mold to form a product having a shape defined in part by said mold and said foraminous surface, said mold comprising:

(i) a first mold portion adjacent said foraminous surface defining an opening of predetermined shape and dimensions; and

(ii) a second mold portion separated from said foraminous surface by at least said first mold portion and defining an opening of predetermined shape and dimensions which blocks a part of the opening defined by said first mold portion; and

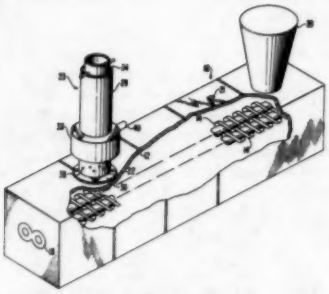
(c) means for moving said molding loop along a path which passes in part adjacent to and in the same direction of movement as said foraminous surface and in part away from said foraminous surface leaving products formed in said mold deposited on said foraminous surface.

4,892,471

STEAM VENTING EXTRUDER FEEDER

John E. Baker, Farmers Branch, and Ramon Cantu, Dallas, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Sep. 23, 1988, Ser. No. 249,344
Int. Cl.[4] B29C *31/10, 47/00*
U.S. Cl. 425—132 5 Claims



1. An extruder feeder apparatus for feeding moisture-containing solid materials into a downstream port of a food extruder for preparing an extrudate in which the extrudate at the downstream port has a temperature such that steam is generated in the extrudate and such steam hinders solid material feeding, the feeder apparatus comprising:

(a) a feed tube for feeding solid materials into the extruder through an extruder wall opening;

(b) means defining a steam exit passage through the extruder wall opening and surrounding the feed tube, said means including vent openings allowing ambient, untreated air to enter the steam exit passage; and

(c) means for pressure assisting the venting of the steam from the extruder and the feed of solid materials within the feed tube, said means for pressure assisting comprising a compressed air chamber which surrounds the outer tube and comprises

(i) an inlet for the introduction of compressed air into a housing of the compressed air chamber, and

(ii) an air directing ring disposed within the housing and comprising a restricted passageway for directing the compressed air into the steam exit passage,

whereby compressed air injected into the steam exit passage induces (1) ambient, untreated air to enter the steam exit passage through the vent holes, (2) ambient, untreated air to enter the feed tube and assist in the downward flow of the solid materials and (3) steam generated in the extruder to be vented out of the apparatus through the steam exit passage.

4,892,472

AUTOMATIC PART-RUNNER SEPARATOR CHUTE

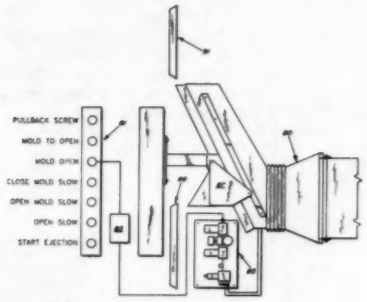
James Harrison, 13182 Marshall La., Tustin, Calif. 92680

Continuation-in-part of Ser. No. 797,692, Nov. 13, 1985, Pat. No. 4,710,124. This application Mar. 3, 1987, Ser. No. 21,132
Int. Cl.[4] B29C *39/44, 41/52, 41/42, 45/76*
U.S. Cl. 425—139 10 Claims

1. Apparatus for separating runners and molded products ejected from an injection mold assembly, comprising:

a control circuitry disposed externally of the mold assembly for generating mold control signals to regulate the operation of the mold assembly; and

a chute mechanism disposed proximate the mold assembly and connected with said control circuitry, the chute and mechanism being operative to separate products and runners by directing products and runners entering the chute



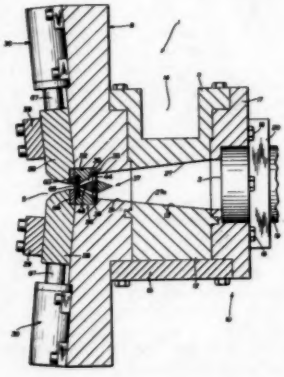
to different collection areas in response to the mold control signals from the control circuitry.

4,892,473

HEAD FOR EXTRUSION OF ELASTOMERIC CONTOUR INNERLINER

Gerardo P. Elia, Akron, Ohio; Gaetan Arbour, Joliette, Canada, and Ivan Z. Podobnik, Stow, Ohio, assignors to Bridgestone/-Firestone, Inc., Akron, Ohio

Filed Dec. 22, 1988, Ser. No. 288,594
Int. Cl.[4] B29C *47/68*
U.S. Cl. 425—197 9 Claims



1. An extrusion head for extruding a laminated sheet of an elastomeric material including:

(a) a chamber having an entrance for receiving an incoming supply of the elastomeric material and a discharge end, said chamber being defined by spaced walls dimensional to diverge the width and converge the thickness of the incoming elastomeric material as it moves toward the discharge end;

(b) insert means mounted in the discharge end of the chamber for splitting the elastomeric material into at least a pair of separate streams of said elastomeric material;

(c) breaker means mounted in the discharge end downstream of the insert means for removing any foreign particles present in the separate streams of elastomeric material; and

(d) die means located downstream of the breaker means for converging the separate streams of elastomeric material

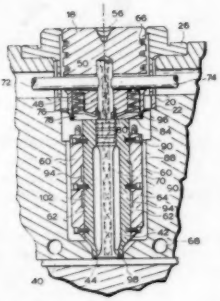
toward an orifice and for maintaining said streams separate until entering the orifice where they are joined to form the laminated sheet of elastomeric material.

4,892,474

PROFILED PLATE HEATERS FOR INJECTION MOLDING NOZZLES

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Feb. 21, 1989, Ser. No. 312,467
Int. Cl.[4] B29C *45/20, 45/72*
U.S. Cl. 425—549 **6 Claims**



1. In an elongated injection molding heated nozzle having a central portion extending between a rear portion adjacent a rear end and a forward portion adjacent a forward end, and a melt bore extending therethrough from the rear end to the forward end, the improvement wherein:

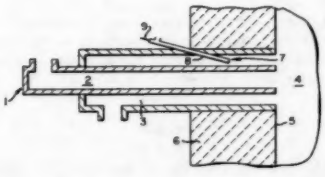
the central portion of the nozzle has at least one outer face which receives an electric plate heater securely mounted thereagainst, the plate heater having an inner face which abuts against said at least one outer face of the central portion of the nozzle, the inner face of the plate heater and said at least one outer face of the central portion of the nozzle being shaped to define at least one insulative air space therebetween having a configuration to provide heat flow from the plate heater to the nozzle according to a predetermined profile.

4,892,475

IGNITION SYSTEM AND METHOD FOR POST-MIXED BURNER

Dennis R. Farrenkopf, Bethel, Conn., and William J. Snyder, Ossining, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 8, 1988, Ser. No. 281,459
Int. Cl.[4] F23C *5/00*; F23Q *7/06*
U.S. Cl. 431—8 **18 Claims**



1. A method for igniting a combustible mixture comprising:

(A) passing main oxidant into a combustion zone from the discharge end of a main oxidant passage;

(B) passing fuel into the combustion zone, separately from the main oxidant, from the discharge end of a fuel passage to form a combustible mixture in the combustion zone;

(C) passing igniter oxidant having an oxygen concentration greater than that of air through a tube containing an electrode into the fuel passage at an angle not exceeding 45 degrees to the direction in which the fuel is flowing toward the discharge end, at a point recessed from the discharge end of the fuel passage;

(D) creating a spark from the electrode to cause combustion of fuel and igniter oxidant within the fuel passage;

(E) passing combusting fuel and igniter oxidant from the fuel passage into the combustion zone to ignite the combustible mixture; and

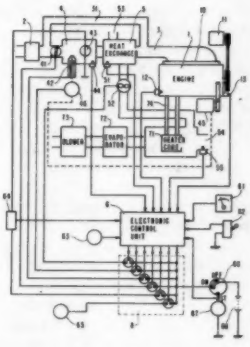
(F) terminating the flow of igniter oxidant while maintaining the flow of main oxidant into the combustion zone.

4,892,476

APPARATUS FOR CONTROLLING COMBUSTION IN HEATER

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,056
Claims priority, application Japan, Oct. 29, 1986, 61-257474
Int. Cl.[4] F23N *1/00*
U.S. Cl. 431—36 **5 Claims**



1. An apparatus for controlling combustion in a heater including a burner having an atomizing device for atomizing supplied fuel and an igniting device for igniting fuel atomized by the atomizing device, the apparatus comprising:

detector means for detecting the temperature in said burner and outputting a temperature signal;

means for selecting a re-ignition mode based on the temperature signal from said detector means;

said re-ignition mode selecting means including means for selecting a first mode in which the atomizing device is operated at a basic atomizing temperature when the temperature in said burner as detected by said detector means is higher than a predetermined temperature, and for selecting a second mode in which the atomizing device is operated at a temperature higher than said basic atomizing temperature when the temperature in said burner is lower than said predetermined temperature; and

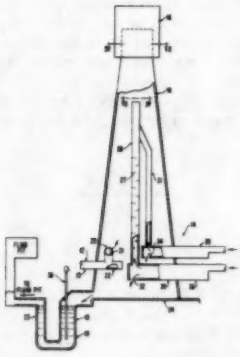
control means for controlling said atomizing device in the re-ignition mode when selected by said re-ignition mode selecting means.

4,892,477

APPARATUS FOR FLARING GAS

Larry Zimmiond, Highway 23, P.O. Box 7, Keene, N. Dak. 58847

Filed Sep. 30, 1987, Ser. No. 102,605
Int. Cl.[4] F23D 13/20
U.S. Cl. 431—202 3 Claims



1. An apparatus for flaring gas, comprising:
flare stack means, having a base, for flaring gas;
fluid pit means for storing fluid;
gooseneck pipe means, coupled to the base of said flare stack means and to said fluid pit means, said gooseneck pipe means being configured to maintain a reservoir of fluid therein at a predetermined level;
high pressure inlet means for introducing a first combination of waste gas and liquid of a first predetermined pressure or greater, into said flare stack means, said high pressure inlet means including first separating means for separating the liquid in said first combination of waste gas and liquid from the waste gas in said first combination of waste gas and liquid;
said first separating means including an inlet pipe having a first drainage aperture and a t-shaped pipe coupled to said inlet pipe, said t-shaped pipe being open at both ends of the t allowing venting of gases into the flare stack, and said drainage aperture draining said liquids into said gooseneck pipe via said routing means;
low pressure inlet means for introducing a second combination of waste gas and liquid, of a second predetermined pressure less than that of said first predetermined pressure, into said flare stack means, said low pressure inlet means including second separating means for separating the liquid in said second combination of waste gas and liquid from the waste gas in said second combination of waste gas and liquid; and
means for routing the liquid separated from said first and second combination of waste gas and liquid into said gooseneck pipe.

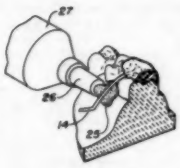
4,892,478

METHOD OF PREPARING DENTAL APPLIANCES

Louis H. Tateosian, York, Pa., and Louis C. Souder, Ocean City, N.J., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Mar. 21, 1988, Ser. No. 171,493
Int. Cl.[4] A61C 13/00, 13/01
U.S. Cl. 433—6 4 Claims

1. A method of preparing a dental appliance comprising the steps of
(a) preparing a dental cast of a patients 'mouth,
(b) adapting a dental appliance substructure to said dental cast,
(c) placing said substructure on said dental cast,
(d) extruding at least one stream of self-merging hardenable dental gel around said substructure and on said dental cast in adjacent extruded portions and permitting said adjacent extruded portions to merge together whereby there are no



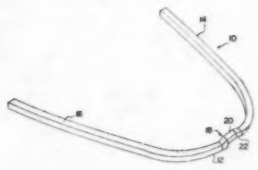
interface lines between said adjacent extruded portions, said gel comprising a colloidal system of a hardenable dispersing medium, a colloid, and a catalyst, and having a viscosity of 8000 to 50,000 cps at 20 RPM's and a slump of 10 mm to 27 mm, and
(e) curing said gel in one step to produce a dental appliance without interface lines having a form adapted specifically for said patients'mouth.

4,892,479

ORTHODONTIC ARCH WIRE

John C. McKenna, 39 Stoner Dr., West Hartford, Conn. 06107

Filed Oct. 11, 1988, Ser. No. 255,495
Int. Cl.[4] A61C 3/00
U.S. Cl. 433—20 10 Claims



1. In an orthodontic arch wire used with anterior brackets comprising a wire of uniform cross-section along its length having a generally U-shaped configuration and defining both a principal plane of the arch wire and center line for the arch within the plane, the improvement wherein the wire is provided with a mid-point marker in the form of a displaced wire portion offset from the principal place of the arch wire at the center line, said displaced offset including a pair of integral inclined portions connecting the offset to the remainder of the wire, the ends of said inclined portions connected to the remainder of the wire defining a gap therebetween within the plane of the wire, said offset being spaced from the wire by up to about 0.012 inch and being insufficient to substantially alter the continuous radial curvature of the arch wire at the center line or to apply force components to the wire.

4,892,480

FACE BOW

Ronald R. Levandoski, 1103 Powell Ave., Erie, Pa. 16505

Filed Sep. 14, 1988, Ser. No. 244,098
Int. Cl.[4] A61C 19/04
U.S. Cl. 433—73 10 Claims

1. In combination a face bowl and an articulator,
said face bow comprising a vertically extending rod, a first bracket, a second bracket, and a third bracket,

said first bracket, said second bracket and said third bracket each being vertically adjustably and slidably received on said vertically extending rod,

a teeth engaging fork means having a first support rod attached thereto and slidably received in first bracket,

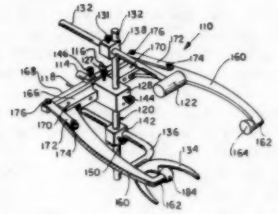
a naison indicating member having a second support rod attached thereto,

said second support rod being slidably horizontally an adjustably supported on said third bracket,

said calipers removably supported on said second bracket,

said calipers having auditory meatus engaging means thereon whereby said calipers can be supported on the auditory meatus of a patient, thereby supporting said face bow on said patient,

said articulator having an upper frame and a lower frame, a first denture support on said upper frame, a second denture support on said lower frame aNd condyle means,



said condyle means swingably supporting said second denture support relative to said first denture support,

said calipers being adapted to be removed from said second bracket and said face bow transferred to said articulator,

a face bow recess means on said lower frame of said articulator for receiving a part of said vertical support,

said vertical support rod having a part adapted to be received in said recess means whereby said face bow is supported on said articulator,

said first denture support having means thereon to adjust said first denture support relative to said naison indicator,

said second denture support being adapted to be adjusted to conform to said teeth engaging fork means on said articulator to position said denture supports relative to one another to be articulated on said articulator.

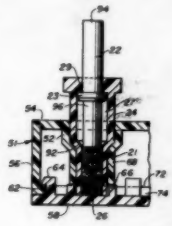
4,892,481

DENTAL COMPOSITE CARRIER AND COMPOSITE PACKAGE

Thomas V. Kopunek, Lewes, Del., and Douglas D. Bennett, Cambridge, Md., assignors to Dentsply Research & Development Corp., Milford, Del.

Division of Ser. No. 35,574, Apr. 7, 1987, Pat. No. 4,767,325.
This application Jul. 6, 1988, Ser. No. 215,657
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—90 **5 Claims**

1. A package for a composite comprising: a plurality of composite ampules, each said ampule comprising a composite reservoir and a piston, said reservoir being open at one end and having a piston received in a distal end; a tray for storing said ampules having a top part having an upper surface and a lower surface said top part having mounting stations therein, each said mounting station being adapted to receive a composite ampule in said upper surface of said tray and having composite ampules received therein for storage, said mounting stations



being adapted to permit easy removal of said ampules therefrom when said ampules are used.

4,892,482

DENTAL RETRACTION CORD

Michael P. Lococo, 4999 Victoria Avenue, Niagara Falls, Ontario, Canada L2E 4C9

Filed Aug. 30, 1988, Ser. No. 238,191
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—136 **11 Claims**

1. Dental retracting cord comprising a plurality of flexible braided strands made of a liquid permeable material, and at least one stiffener strand generally integral with the cord and continuously extending throughout the entire length thereof, said stiffener strand being made of a generally non-resiliently deformable material having a form retaining capability greater than that of said braided strands, to render the entire length of the cord generally non-resiliently bendable in order to facilitate the application thereof.

4,892,483

ORAL DRUG RETAINING DEVICE

Jesse B. Douglas, Jr., Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

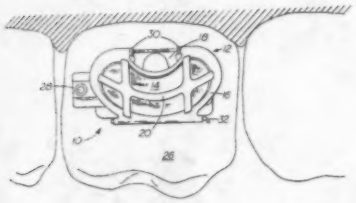
Filed Aug. 15, 1988, Ser. No. 231,959
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—229 **3 Claims**

1. An apparatus for retaining a matrix impregnated with a pharmacologic agent in the mouth of a patient, comprising:

receptacle means including a basket and a frame for receiving and protecting said impregnated matrix from physical damage due to mastication and tooth brushing;

means for opening and closing said basket and said frame including latch means and hinge means on opposing sides

of said basket and said frame that allow replacement of said impregnated matrix; and



means for mounting said receptacle means to a tooth of the patient.

4,892,484

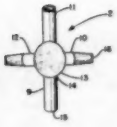
INTERCONNECTING TOY

Dorothy M. Brown, and John S. Brown, both of 2570 Wells Rd., Ashland, Ohio 44805

Filed Mar. 6, 1989, Ser. No. 319,303

Int. Cl.[4] G09B *1/36*; A63H *33/08*

U.S. Cl. 434—259 **8 Claims**



1. An educational toy, comprising:

a first game piece, having a plurality of first tubular members extending therefrom, said first game piece establishing a base;

a plurality of second game pieces, each having a plurality of second tubular members extending therefrom, said first and second tubular members being adapted for mating interconnection with each other; and

wherein certain of said tubular members are of a uniform cross section along a length thereof, and others of said tubular members are tapered, having a gradually changing cross section along a length thereof, said tapered tubular members extending from a smaller unattached end to a larger end attached to the respective game piece, and being of various cross sectional geometric configurations, tubular members of one game piece being adapted for mating interconnection with tubular members of like cross sectional configurations of another game piece, said tubular members including indicia thereon for indicating the mateability of each tubular member with other tubular members.

4,892,485

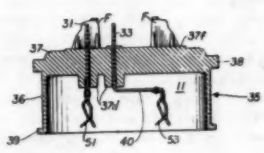
ADAPTER PLATE FOR CONVERTING A THREE PHASE METER SOCKET FOR USE WITH A SINGLE PHASE WATT HOUR METER

Victor L. Patton, Grass Valley, Calif.

Filed Jun. 16, 1988, Ser. No. 207,543

Int. Cl.[4] H01R *29/00*

U.S. Cl. 439—167 **27 Claims**



1. An adapter plate interposed between a single phase meter and three phase meter socket comprising, in combination:

a sleeve for uniting the single phase meter to the socket having a barrier contained within said sleeve to preclude direct contact between the socket and the meter,

a coupling to connect 120 volt clips of the socket to the meter including means for offsetting two of the socket clips to align with the meter,

wherein said offsetting means include first and second bus bars for offsetting two of said socket clips with respect to their connection with the three phase meter socket, said bus bars communicating with the socket by means of blades extending from an exterior wall of said barrier,

wherein said sleeve has at extremities thereof peripherally extending flanges to serve as abutment stops limiting the amount of orientation required to place said adapter sleeve in the socket, and to limit the placement of the single phase meter within said sleeve.

4,892,486

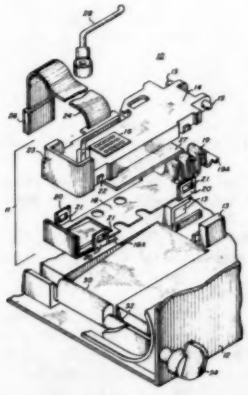
PORTABLE COMMUNICATIONS DEVICE ADAPTOR

Andrzej T. Guzik, Pompano Beach; Rudy Yorio, Boca Raton; Joseph A. Budano, II, Plantation, and Mark Tellam, Parkland, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 2, 1988, Ser. No. 279,002

Int. Cl.[4] H01R *13/629*

U.S. Cl. 439—248 **16 Claims**



1. A adaptor for receiving therein a portable communica-

tions device having a first set of accessible electrical contacts, said adaptor comprised of:

a mounting base adapted to receive said portable device therein;

a connector assembly having a second set of electrical contacts disposed to mate with said first set of accessible electrical contacts;

means which mounts said connector assembly to said mounting base so that said second contact set can be moved with respect to said communications device in at least two orthogonal dimensions to permit alignment with said first contact set when said communications device is received in said adaptor; and

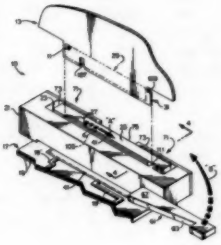
actuator means for moving said connector assembly with respect to said mounting base so as to cause said first and second contact sets to mate.

4,892,487

CONNECTOR ASSEMBLY WITH MOVABLE CARRIAGE

David W. Dranchak, Endwell; David E. Engle, Vestal, and Alan D. Knight, Newark Valley, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,848
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—260 **17 Claims**



1. An electrical connector assembly for providing electrical connection between at least one contact element on a circuit board and a corresponding conductor located on a circuit device, said connector assembly comprising:

a housing for being positioned adjacent said circuit device and including an opening therein;

a flexible circuit member located substantially within said housing and including a first terminal thereon for engaging said contact element on said circuit board and a second terminal thereon electrically coupled to said first terminal and adapted for engaging said corresponding conductor on said circuit device;

a carriage movably positioned within said opening within said housing and including a slot therein for having said circuit board located therein, said carriage and said circuit board occupying a first position within said housing wherein said contact element on said board and said first terminal of said flexible circuit member are not engaged, said carriage and said circuit board adapted for moving to a second position wherein said contact element and said first terminal are engaged to provide electrical contact therebetween;

actuation means operatively connected to said carriage to cause said carriage and said circuit board to move from said first position to said second position; and

biasing means secured to or forming part of said housing for biasing said carriage within said housing in a direction toward said flexible circuit member when said carriage occupies both said first and second positions within said housing and during said movement between said first and second positions.

4,892,488

IGNITION CABLE TERMINATION ASSEMBLY AND METHOD OF MAKING SAME

Charles R. Nestor, Niles, and John A. Yurtin, Southington, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1987, Ser. No. 117,050
Int. Cl.[4] H01R 4/24, 11/20
U.S. Cl. 439—438 **10 Claims**

1. A cable termination assembly for terminating a cable comprising:

a cable which has an insulation jacket and a conductive core which has a stripped end portion which projects axially of the insulation jacket,

an insulator housing which has a plug portion at one end for receiving a terminal and an attachment portion at the other end which secures the insulator housing to the insulation jacket of the cable, and

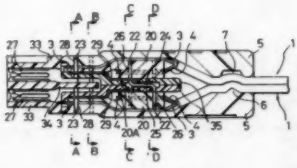
a terminal which is disposed in the insulator housing and which has a socket portion at one end which is disposed in the plug portion of the insulator housing and a ferrule portion at the other end which surrounds and biasingly engages the stripped end portion of the conductive core of the cable.

4,892,489

FLAT-CABLE CONNECTOR

Yuji Hirai, Tokyo, Japan, assignor to Honda Tsushin Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,528
Claims priority, application Japan, Jul. 28, 1988, 63-186755
Int. Cl.[4] H01R 9/07
U.S. Cl. 439—497 **6 Claims**



1. A flat-cable connector for use in connecting to a flatcable having a plurality of signal conductors arranged at regular intervals each accompanying a grounding conductor comprising:

a cable cover having a plurality of first ridges arranged at intervals in the form of comb-teeth and integrally connected to the inner surface of the cable cover, each ridge having a longitudinal groove made at its top for accommodating a selected grounding conductor and a lateral groove made at its top for accommodating a selected grounding terminal; and a plurality of second ridges arranged at intervals in the form of the comb-teeth and integrally connected to the inner surface of the cable cover, each ridge having a longitudinal groove made at its top for accommodating a selected signal conductor and a lateral groove made at its top for accommodating a selected contact terminal, said first ridges confronting the inter-ridge spaces of said second ridges and vice versa;

a cable housing having staggered ribs arranged at intervals

in the form of comb-teeth and integrally connected to the under surface of the cable housing, said staggered ribs being adapted to fit in the staggered inter-ridge spaces of said cable cover;

a grounding contact member comprising a common grounding plate and a plurality of upright grounding terminals integrally connected to the common grounding plate, each terminal having a pinch slit made at its top; and

a plurality of press contact terminals;

said cable cover having said grounding contact assembly assembled thereto with each upright grounding terminal inserted in each lateral groove of each of said first ridges, and each of said press contact terminals being inserted in each lateral groove of each of said second ridges.

4,892,490

ELECTRICAL CONNECTOR ENABLING PREVENTION OF INCOMPLETE COUPLING

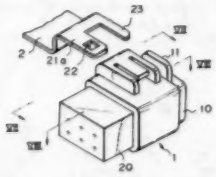
Yoshikazu Tsuchiya; Hideki Kano; Yasuyuki Aihara; Noboru Miyazaki; Izumi Suzuki, and Kiyofumi Ichida, all of Tochigi, Japan, assignors to Honda Giken Kogyo K.K., Tokyo and Sumitomo Wiring System, Ltd., Mie, both of, Japan

Filed Dec. 14, 1988, Ser. No. 284,114

Claims priority, application Japan, Dec. 15, 1987, 62-190398[U]; Dec. 15, 1987, 62-190399[U]

Int. Cl.[4] H01R *13/60*

U.S. Cl. 439—533 **2 Claims**



1. An electrical connector and mounting means therefor, comprising:

a male connector having a male connector body;

a female connector having a female connector body joinable with said male connector body along an axis for forming the connector; and

a support bracket for supporting said connector on another structure, said support bracket having a support finger and a detection finger projecting substantially parallel to each other and transversely to said axis;

one of said connector bodies having a path therethrough corresponding to the shape and dimensions of said support finger and into which said support finger is insertable for supporting said connector on said bracket, and the other of said connector bodies having a rib thereon, said rib being positioned, when said connector bodies are improperly coupled, for being abutted by said detection finger for preventing entry of said support finger into said path, and said rib being positioned, when said connector bodies are properly coupled, for being engaged by said detection finger for blocking movement of said other connector body relative to said one connector body transverse to said axis.

4,892,491

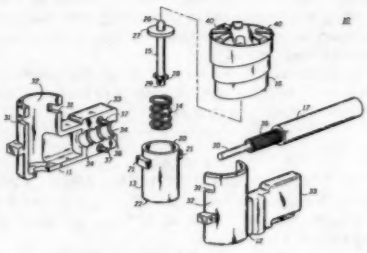
COAXIAL CONNECTOR

Joseph A. Budano, II, Plantation; Andrzei T. Guzik, Pompano Beach; Rudy Yorio, Boca Raton, and Harold M. Cook, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1988, Ser. No. 286,185

Int. Cl.[4] H01R *17/18*

U.S. Cl. 439—582 **13 Claims**



1. A coaxial connector comprising:

a housing

an insulator carried in the housing;

a center contact carried by the insulator;

a resilient means biasing the center contact; and

a volute spring located about the housing, electrically engaging the housing and providing an outer contact.

4,892,492

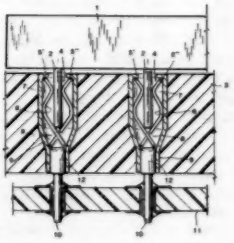
DEVICE WITH OPENINGS FOR RECEIVING PINS OF ELECTRICAL COMPONENTS

Harry B. Mueller, Hollywood Hills, Fla., assignor to Modular Computer Systems, Inc., Fort Lauderdale, Fla.

Filed Jun. 17, 1988, Ser. No. 207,879

Int. Cl.[4] H01R *4/48*

U.S. Cl. 439—828 **5 Claims**



1. A device for receiving pins of electrical components in electrical connection, comprising:

a substrate having an opening therein which extends axially into said substrate and which is bounded by an electrically conductive sidewall, said opening having a mouth, a central axis, an upper portion and a lower portion; said sidewall having a lower concave portion and a lip projecting generally radially inwardly adjacent said mouth of said opening;

a pair of spring elements disposed within said opening which are in facing relationship to each other, each of said spring elements having an upper end portion, a center portion, and a terminal portion;

said terminal portion of each said spring being disposed in said lower portion of said opening in engagement with said concave portion of said sidewall so as to retain said

terminal portion of said spring in a fixed axial position, each said spring extending generally axially from a first side of said opening across said central axis to the opposite side of said opening, both of said spring elements crossing said central axis at substantially common location; and

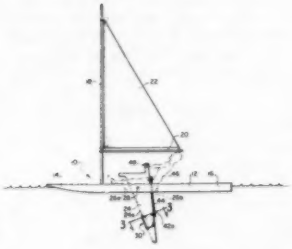
each said spring having a substantially sheet-like body, said terminal portion of each said spring contacting said sidewall in the vicinity of said lower portion of said opening, said upper end portion of each said spring engaging said lip of said sidewall in the vicinity of said upper portion of said opening so as to retain said spring within said opening, and said center portion of each said spring having a first portion which extends generally radially toward said central axis and a second portion which extends generally radially from said first portion toward said sidewall.

4,892,493

SUPPLEMENTAL SAILBOAT PROPULSION DEVICE

Yoram Gil, 1441 S. Beverly Glen Rd., Los Angeles, Calif. 90024

Filed Sep. 29, 1988, Ser. No. 250,742
Int. Cl.[4] B63H *16/08*
U.S. Cl. 440—17 **2 Claims**



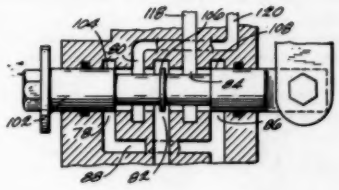
1. A supplemental propulsion device for a sailboat or sailboard type water craft having a pivotal centerboard extending downwardly from the hull of the craft through an elongated hull slot, said propulsion device comprising: a pair of propulsion wings vertically hinged to one-another by a wing hinge, said wing hinge being mounted to the lower portion of the leading edge of the centerboard of said craft whereby upon the application to the centerboard of a reciprocating pumping action each propulsion wing moves inwardly to a retracted position adjacent the centerboard during forward movement of the lower portion of the centerboard and moves outwardly to an extended position removed from the centerboard during rearward movement of the lower portion of the centerboard; cable means connecting the free edge of said propulsion wings to the trailing edge of the centerboard and of a length to stop the outwardly movement of said wings at a point no more than 90 degrees from the centerboard during rearward movement of the lower portion of the centerboard whereby said wings provide enlarged and effective thrust surfaces to the surrounding water to forcefully propel said craft through the water; handle means at the upper portion of said centerboard for use by a sailor to pump said centerboard and thereby reciprocate said propulsion wings; and means at the free edges of the propulsion wings to lock said wings in their retracted position adjacent the centerboard when the water craft is under sailing propulsion and the supplemental propulsion device is not to be used.

4,892,494

POWER STEERING MECHANISM FOR MARINE INSTALLATIONS

Arthur R. Ferguson, Northbrook, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 28,958, Mar. 23, 1987, Pat. No. 4,744,777. This application Apr. 4, 1988, Ser. No. 177,530
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **42 Claims**



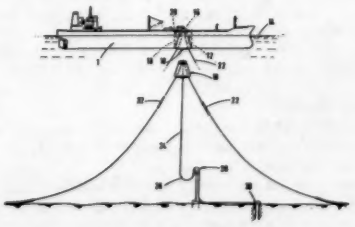
1. A marine propulsion device comprising mounting means adapted to be mounted on a boat and including a tilt tube extending along a generally horizontal tilt axis, a propulsion unit mounted on said mounting means for pivotal movement relative thereto about said tilt axis and about a generally vertical steering axis, said propulsion unit including a propeller shaft adapted to rotatably support a propeller, an elongated member slideably housed within said tilt tube for axial movement relative thereto, an extendible and contractible hydraulic assembly having a first end adapted to be connected to the boat, and a second end connected to said propulsion unit for causing pivotal movement of said propulsion unit about said steering axis, valve means including a first member fixedly connected to said second end of said hydraulic assembly, and a second member reciprocally movable relative to said first member, and a link member having a first portion pivotally connected to said elongated member, a second portion pivotally connected to said second member, and a third portion pivotally connected to said first member.

4,892,495

SUBSURFACE BUOY MOORING AND TRANSFER SYSTEM FOR OFFSHORE OIL AND GAS PRODUCTION

Niels-Alf Svensen, Leanglia 16, N-1370 Asker, Norway

PCT No. PCT/NO87/00025, § 371 Date May 6, 1988, § 102(e) Date May 6, 1988, PCT Pub. No. WO87/05876, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 24, 1987, Ser. No. 188,551
Claims priority, application Norway, Mar. 24, 1986, 861171
Int. Cl.[4] B63B *22/02*
U.S. Cl. 441—5 **10 Claims**



1. A subsurface vessel mooring and loading system for offshore petroleum production, comprising:

submersible buoy to be anchored to a sea bed by a plurality of mooring lines to extend from the sea bed to said buoy;

at least one riser pipe to extend from at least one production well in the sea bed and having a top end connected to said buoy;

a loading vessel having a hull, and open tunnel shaft opening into said hull, and receiving loading facilities;

a rotatable turret seat mounted in said tunnel shaft to extend above the high draft water line in said tunnel shaft, said turret seat having a generally annular ring shape, said buoy being adapted to be firmly seated in said turret seat such that a top side of said buoy is above the high draft water line in said tunnel shaft, and product receiving means in said turret seat;

first product transfer means extending laterally from said top end of said at least one riser pipe to said product receiving means of said turret seat; and

second product transfer means extending between said turret seat and said receiving loading facilities of said vessel.

4,892,496

WEB GLOVE

Charles Vondruska, Box 1662, Newport Beach, Calif. 92663

Filed Aug. 22, 1988, Ser. No. 234,545

Int. Cl.[4] A63B *31/02*

U.S. Cl. 441—57 **1 Claim**

1. A swimming glove for placement over the hand of a swimmer, comprising hollow elongate finger and thumb portions, said portions being joined to one another by integral flexible web portions, and an elongated removable brace for maintaining said swimming glove in an outstretched configuration, said elongated removable brace extending from an outer end of an elongated finger portion intended to accommodate the little finger of a swimmer, to an outer end of the elongated thumb portion.

4,892,497

METHOD FOR ASSEMBLY OF LASER MIRRORS

Edwin G. Chaffee, Salt Lake City, Utah, assignor to American Laser Corporation, Salt Lake City, Utah

Division of Ser. No. 117,668, Nov. 5, 1987, Pat. No. 4,803,697. This application Nov. 14, 1988, Ser. No. 270,674

Int. Cl.[4] H01S *30/03*

U.S. Cl. 445—28 **5 Claims**

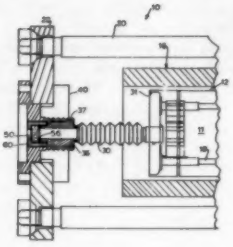
1. The method of processing a gas laser tube comprising:

(a) assembling a gas laser tube with both cathode and anode ends left open;

(b) installing the open ended tube in a heated vacuum oven;

(c) heating the open tube while in the vacuum oven to cause contaminating substances within the tube to be driven out; and

(d) installing mirrors on the ends of the tube utilizing pressure sensitive adhering means between the tube ends and the mirror surfaces adhered thereto by placing said pressure sensitive adhering means between said mirrors and open ends and forcing said mirrors against said pressure



sensitive adhering means by threaded mirror retainers screwed on said open ends.

4,892,498

PROCESS FOR VACUUM-TIGHT SEALING OF A CERAMIC TUBE

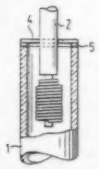
Reinhold Gradl, Rückersdorf, and Klaus Popp, Nuremberg, both of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,357

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803227

Int. Cl.[4] H01J *9/26*

U.S. Cl. 445—44 **18 Claims**



1. A process for vacuum-tight sealing of a cylindrical tube of translucent alumina ceramic, using a metallic current bushing, which comprises

(1) applying to the ends of the tube a metallizing paste which contains

(a) at least one finely dispersed metal powder, selected from the group comprising tungsten, molybdenum, niobium and tantalum,

(b) a liquid organic binder and

(c) a pulverulent calcium-magnesium silicate having a melting point in the range 1200–1500° C.,

(2) producing a thin metal layer on the alumina ceramic by burning the paste in,

(3) after burning-in of the metallizing paste, depositing a further layer of nickel or copper on the remaining metal layer,

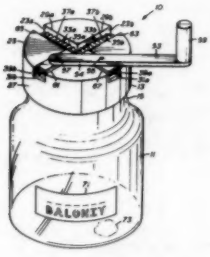
(4) inserting metallic current bushings into the tube in the region of the tube ends and sealing the ends vacuum-tight in the metallized areas by means of a brazing solder having a melting point between 950° and 1200° C., if necessary with the use of disk-shaped gasket elements.

4,892,499

NOVELTY GRINDER

Luay Ayyoubi, P.O. Box 8636, The Woodlands, Tex. 77387-8636, and Theresa R. Beck, 27220 Blueberry Hill Dr., Conroe, Tex. 77385

Filed Nov. 4, 1988, Ser. No. 267,227
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—81 **4 Claims**



1. A novelty grinder comprising:
a grinder base having an upper surface;
a container having an open upper end, said grinder base being mounted on and closing said open upper end of said container;
a pair of guide channels formed in the upper surface of said grinder base, said guide channels being substantially perpendicular to one another and intersecting substantially at the center of said upper surface of said grinder base;
a pair of shuttle members slidably disposed in said guide channels, each shuttle member being disposed in a separate one of said guide channels and being adapted for reciprocating translational movement in its respective guide channel;
retaining means disposed on said shuttle members and said guide channels for preventing the removal of said shuttle members from said guide channels in a direction transverse to the direction of their reciprocating translational movements;
crank means pivotally connected to each of said shuttle members for causing said reciprocating translational movement of said shuttle members in said guide channels when said crank means is rotated about said grinder base;
said guide channels having a dovetailed configuration in cross-section and said shuttle members having a cross-section that is wider at its widest point than the opening of said dovetailed guide channels, and further including a serrated surface in the bottom of each of said guide channels and a rib projecting from the bottom of each of said shuttle members, said ribs engaging each of the serrations of said serrated surfaces in succession when said shuttle members reciprocate in said guide channels.

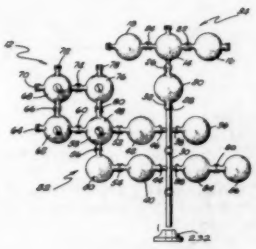
4,892,500

VERSATILE NETWORK OF MULTIPLE SPOUT BALLOONS

Po Chun Lau, 8224 Wilkinson Ave., North Hollywood, Calif. 91605

Filed Mar. 1, 1988, Ser. No. 162,663
Int. Cl.[4] A63H *3/06*; F16L *41/00*; G09B *23/26*
U.S. Cl. 446—221 **21 Claims**

1. A versatile network of multiple spout inflatable toy balloons comprising:
a plurality of inflatable balloons being formed of material which is resilient and expandable, each of said balloons having a body and at least two integral spouts, formed of the same material as the remainder of said balloon with said spouts being necked down and extending from the body of the balloon, each said balloon constituting a single air chamber and being continuously inflatable to any desired size up to a certain maximum size beyond which it may explode, each said balloon comprising film walls which are expandable and stretchable to many times their non-inflated configuration;
at least one plug, each of said plug having at least two ends with at least one end including means for making an airtight joint with a balloon spout, said spout making resilient airtight engagement with a corresponding end of said plug; and



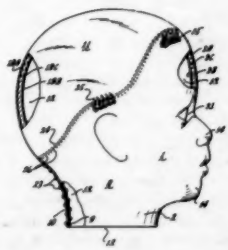
each said balloon being capable of interconnecting to at least another one of said balloons using one of said plugs at each interconnection, with one end of said plug making resilient airtight engagement with a spout of one of said balloons, and another of said ends of said plug making resilient airtight engagement with a spout of another one of said balloons;
whereby said balloons may be interconnected in a deflated state to form an airtight, versatile, three dimensional network of balloons, which may be readily transported and inflated to form a network at a chosen location.

4,892,501

DOLL'S HEAD AND METHOD OF FABRICATION

Leonard Girelli, Stanley, Hong Kong, assignor to Mattel, Inc., Hawthorne, Calif.

Continuation of Ser. No. 808,516, Dec. 13, 1985, abandoned. This application Feb. 25, 1988, Ser. No. 160,376
Int. Cl.[4] A63H *3/02*
U.S. Cl. 446—372 **26 Claims**



1. A method of forming a doll's head, in which face and neck portions (1 and 2) have molded textile fabric surfaces;
Comprising the steps of
adhesively attaching a first sheet (3A) of textile fabric to one side of a first sheet (3C) of foamed plastic to form a first laminate (3);
pressing the first laminate (3) between male and female dies (6 and 7) of a first pressure mold with the first textile fabric sheet (3A) adjacent to the female die (7) and heating at

least one of the dies (6 and 7) to form said face portion (1) of a doll's head and an integral neck extension (8) having two ends (9 and 10);

forming a crown portion (11) for the doll's head from pliable sheet material;

attaching the crown portion (11) to the face portion (1) and to the integral neck extension (8) to form part of an outer casing;

connecting the two ends (9 and 10) of the neck extension (8) to form said neck portion (2) and complete said outer casing; and

filling the outer casing with stuffing (12).

4,892,502

TOY VEHICLE WITH OWN MOTOR DRIVE

Kurt Hesse, Waldstrasse 36, D-8510 Fürth, Fed. Rep. of Germany

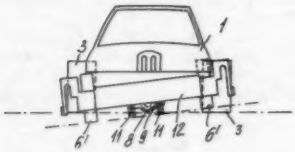
PCT No. PCT/DE86/00447, § 371 Date Sep. 17, 1987, § 102(e) Date Sep. 17, 1987, PCT Pub. No. WO87/04362, PCT Pub. Date Jul. 30, 1987

PCT Filed Nov. 25, 1986, Ser. No. 116,564

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1986, 3602349

Int. Cl.[4] A63H *17/26*

U.S. Cl. 446—454 3 Claims



1. An improved toy vehicle driven by a motor thereon particularly a toy car for toy race track systems, having a front undercarriage part with front wheels and, separated therefrom, a rear undercarriage part with back wheels, and having a vehicle assembly placed above both undercarriage parts and tightly gripping the rear undercarriage part, the front undercarriage part being arranged separately from the vehicle assembly, the improved toy vehicle is also provided with a swivel axle positioned in parallel with respect to the longitudinal vehicle axis in the area between the front and back wheels, the axle serving to pivotably interconnect the front and back undercarriage parts relative to each other, wherein the improvement comprises:

the swivel axle having one end fixed on the rear undercarriage part and an opposite end extending into and rotatably supported by a clamping ring positioned on the front undercarriage part, said opposite end of the axle which is rotatable with respect to the front undercarriage part has a collar permanently fixedly attached to said opposite end, which collar acts as an abutment to prevent axial movement of the freely rotatable front undercarriage part between the fixed rear undercarriage part and collar in the axial direction;

a bridge fixedly mounted on each of the front and rear undercarriage parts, each of said bridges having a pair of free ends; and,

holding elements having lateral guide edges supporting the toy vehicle on the race track mounted on each free end of said bridges.

4,892,503

ACTION TOY VEHICLE WITH CONTROLLABLE AUXILIARY WHEEL

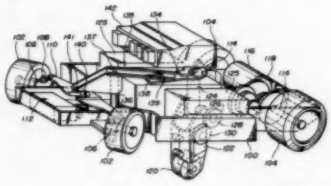
Kiyoshi Kumazawa, Tokyo, Japan, assignor to Apollo Corporation, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,167

Claims priority, application Japan, Aug. 5, 1987, 62-195747; Aug. 11, 1987, 62-200362; Oct. 29, 1987, 62-274214

Int. Cl.[4] A63H *17/39*

U.S. Cl. 446—456 28 Claims



28. An action toy vehicle comprising:

a vehicular chassis;

a plurality of road wheels rotatably suspended from said vehicular chassis;

a steerable auxiliary wheel;

a first structure for supporting said auxiliary wheel, said structure being so constructed and arranged so as to be selectively shifting said auxiliary wheel between a first position in which said plurality of road wheels are in contact with a road surface and a second position in which said auxiliary road wheel is lowered for lifting a portion of the vehicular chassis for releasing at least one road wheel from a road surface;

a second structure for operating said auxiliary wheel for steering while said auxiliary wheel is placed in said second position;

means for selectively providing a control signal; and

means for selectively activating said first and second structure in response to said control signal for shifting said auxiliary wheel from said first position to said second position while said vehicle is in motion on the road surface and causing steering action in said auxiliary wheel for selectively performing desired wheely action and lifting of one side of said vehicle.

4,892,504

STRAW CHOPPER AND SPREADER ASSEMBLY

William A. Scott, and Bernard Penner, both of Winnipeg, Canada, assignors to Gehl Company, West Bend, Wis.

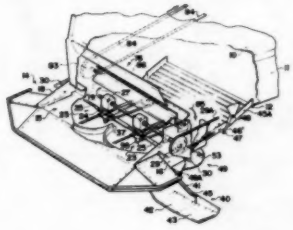
Continuation of Ser. No. 747,447, Jun. 21, 1985, Pat. No. 4,735,216, which is a continuation of Ser. No. 404,611, Aug. 2, 1982, Pat. No. 4,526,180. This application Mar. 29, 1988, Ser. No. 174,786

Int. Cl.[4] A01F *29/02*

U.S. Cl. 460—112 1 Claim

1. An assembly for spreading straw discharged from a rear discharge area of a combine harvester of the type that moves forwardly across the field to be harvested, the apparatus comprising a casing having a base plate, means for mounting the casing adjacent to the rear discharge area such that the base plate lies in a substantially horizontal plane, a pair of rotatable blade means, means mounting each of said blade means on said casing for rotation about a respective one of two vertical axes spaced transversely of the plate such that the blade means overlap between said axes and are rotated in opposed direction so as to sweep straw material deposited on said plate in a direction rearwardly across a line joining the axes and outwardly from said plate, said casing including a substantially vertical wall arranged such that it extends across said plate transversely to the direction of movement of the combine at a

location rearwardly of said blade means and cooperates with said plate and said blade means to discharge the material outwardly to the sides of the combine, said blade means each having a plurality of separate blade members each consisting of a single flat blade extending outwardly from the respective vertical axis with all the blade members of the associated one of the blade means lying in a common place, said mounting means being arranged such that the single flat blades of one blade means overlap and pass vertically above the single flat blades of the other blade means in an area between the axes and such that the blades pass said line joining the axes from the forward



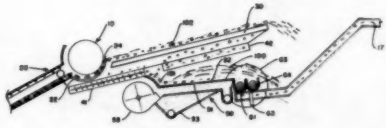
side thereof to a rearward side thereof in phase, a shearing action in the area of the blades being provided solely by the coaction between the blades without any intervening stationary shearing surfaces, said casing mounting means being arranged such that straw from said discharge area enters the area between said blade means forwardly of said line and is discharged from said area rearwardly of said line, guide means for directing the discharge of chopped straw from said blade means rearwardly and to each side of said assemby, and means for generating a spreading force on said straw consisting solely of said blade means and said vertical wall.

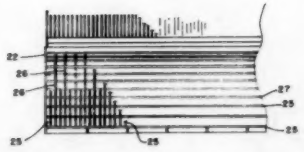
4,892,505

METHOD AND APPARATUS FOR AUTOMATIC CORN COB REDUCTION

Larry Shrawder, R.D. #2, Kempton, Pa. 19529

Filed Feb. 21, 1989, Ser. No. 313,225
Int. Cl.[4] A01F *11/06*
U.S. Cl. 460—149 **7 Claims**





1. A method of reducing cleaned corn cobs into reduced segments and separating the segments from chaff in a combine which has been modified comprising the steps of:

(a) feeding a corn ear having a husk, a stalk, kernels of shelled corn and a cob into the combine having a concave having arcs, a multiplicity of longitudinal bars disposed perpendicular to the arcs and evenly spaced vertical rods parallel to the arcs to form a screen, the combine further having a cylinder, an arc to cylinder adjustment means, a perforated straw separating means and a cleaning means consisting essentially of a cleaning shoe with a defined travel line and having a sieve with a multiplicity of orienting fins above the sieve parallel to the travel line and a pan below the sieve, wherein the combine modification comprises:

(1) changing the concave's configuration from elliptical to circular;

(2) adjusting the space between the cylinder and concave to a clearance sufficient to reduce the corn cobs into segments;

(3) removing alternate vertical rods from the concave beginning with at least the fifth horizontal bar from the front of the concave;

(4) modifying the straw separating means by enlarging the perforations thereof;

(5) installing, adjacent to the cleaning shoe at its discharge end, a cob segment separating and cleaning means;

(b) threshing the ear into shelled corn and chaff consisting of husk, stalk, cob and debris;

(c) reducing the cob between the cylinder and concave into segments which expose pith and are of a defined length;

(d) separating at the concave, the cob segments and chaff into a first and second portion, the first portion consisting essentially of shelled corn and cob segments and the second portion consisting essentially of cob segments, husk, stalk and debris;

(e) conveying from the concave the first portion to the cleaning shoe;

(f) separating at the cleaning shoe the first portion into cob sections and shelled corn;

(g) collecting the shelled corn on the cleaning pan;

(h) conveying from the concave the second portion onto the straw separating means;

(i) separating in the straw separating means cob segments from the second portion husk, stalk and debris;

(j) disposing of the second portion husk and most of the second portion stalk and debris;

(k) conveying the second portion cob segments and remaining stalk and debris to the cleaning shoe;

(l) orienting the stalk on the cleaning shoe sieve by the fin means such that it travels longitudinally;

(m) transporting the cob segments to the cob separating means;

(n) separating the stalk and debris from the cob segments by cob cleaning means;

(o) disposing of the stalk and debris; and

(p) collecting the cob segments.

4,892,506

SYNERGETIC SPEED-VARIATING MEANS AS ECCENTRICALLY OPERATED

Maz Wen, P. O. Box 89-42, Taipei, Taiwan

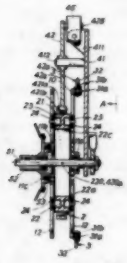
Continuation-in-part of Ser. No. 135,331, Dec. 21, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 337,325
Int. Cl.[4] F16H *55/30;* **B62M** *9/08*
U.S. Cl. 474—49 **8 Claims**

1. A speed variating means for bicycle or like comprising:

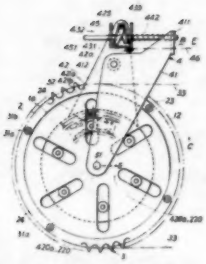
an outer driving disk having a central portion rotatably mounted on axle of a rear bike wheel, a plurality of radial slots formed in the disk each slightly inclined from a corresponding radius of the slot to form an approximate spiral shape of all the slots, and having an outer flange secured with a chain wheel driven by a bike chain;

an inner driving disk corresponding to said outer driving disk having a central annular extension rotatably engageable with a hub of the rear bike wheel, a plurality of radial slots formed in the inner driving disk each slightly inclined from a corresponding radius of each slot to form an approximate spiral shape;

a central sliding-roller carrier means sandwiched between said outer driving disk and said inner driving disk having a plurality of sliding block rotatably engageable in a first annular groove formed in a right side portion of said sliding-roller carrier means each sliding block having a roller protruding outwardly to be slidably engaged with each radial slot formed in said outer driving disk, and having a plurality of sliding blocks rotatably engageable in a second annular groove formed in a left side portion of said inner disk each sliding block having a roller protruding outwardly to engage each radial slot formed in said inner driving disk, each said sliding block having means for operatively coupling said block with said annular groove of said sliding-roller carrier means when forwardly driving said chain wheel and said outer driving disk; and



a variable speed-adjusting means having a fixing plate secured to an axle of the rear bike wheel, and an eccentric plate having a circular disk rotatably mounting said sliding-roller carrier means therein, said eccentric plate being operatively biased to eccentrically move said sliding-roller means with respect to said two driving disks, thereby obtaining a synergetic overall speed variation by multiplying a first speed variation exerting between said outer driving disk and said central sliding-roller carrier means, and a second speed variation exerting between said inner driving disk and said central sliding-roller carrier means.

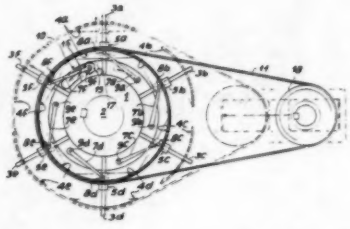


4,892,507

SINGLE OR DOUBLE VARIABLE DIAMETER PULLEY AND SPEED VARIATORS INCLUDING SUCH A DOUBLE PULLEY

Pierre Patin, and Pierre-Armand Patin, both of Paris, France, assignors to Electricite de France Service National, Paris, France

Filed May 31, 1989, Ser. No. 359,625
Claims priority, application France, May 31, 1988, 88 07230
Int. Cl.[4] F16H *55/54*
U.S. Cl. 474—50 **18 Claims**



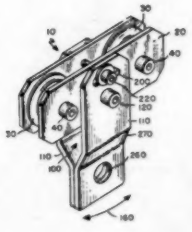
1. Variable diameter pulley rotating about a shaft (2) and provided with displaceable elements (4) for moving towards or away from the shaft under the action of a common regulating mechanism (10,7) all the elements being at a common distance from the shaft, as well as a guidance structure (3) for the displaceable elements, characterized in that the common regulating system is a disk (10) parallel to the pulley, which rotates relative to the pulley and which is provided with rods (4), whereof each is articulated at one end to a displaceable element, carries at its other end a counterweight and pivots (9) at an intermediate point on a pivot located on the disk, the pivots being located on a circle centred on the shaft.

4,892,508

SAFETY GUIDE SUPPORT FOR PIVOTING PULLEY

Robert Ryan, R.R. #1, Box 55, Richardson Rd., Ashby, Mass. 01431; Steven Webster, 21 Essex St., Newburyport, Mass. 01950; Richard Prouty, 20 Langsford St., Gloucester, Mass. 01930, and Peter Rosa, 84 Wildcat La., Norwell, Mass. 02061

Filed Jun. 13, 1989, Ser. No. 365,380
Int. Cl.[4] F16H *7/04;* B61B *12/00*
U.S. Cl. 474—101 **30 Claims**



1. An improved safety control mechanism for a pulley apparatus of the type comprising main support bars having at least two wheels mounted at their centers a spaced distance apart between the bars and a swing arm assembly pivotally connected to the bars at a point between the centers of the wheels, the swing arm assembly comprising a pair of arms straddling opposing surfaces of the bars and pivotally connected to the bars by a main pivot bolt mechanism extending through com-

plementary aligned apertures in the arms and the bars, wherein the improvement comprises:

a second bolt mechanism extending through a second complementary aperture disposed in either the bars or the arms and a slot disposed in the other of the bars or the arms;

the second aperture or the slot provided in the bars being disposed in the spaced distance between the center mountings of the wheels;

the second aperture or the slot provided in the arms being aligned with the other of the second aperture or the slot provided in the bars with the arms and the bars connected by the main pivot bolt;

the slot having an arcuate engagement surface which follows the pivot of the arms and engages the second bolt mechanism against detachment of the arms upon failure of the main pivot bolt;

the second aperture and the slot being disposed around the complementary aligned apertures through which the main pivot bolt extends.

4,892,509

BELT WITH RODS FOR A ROD BELT CONVEYOR

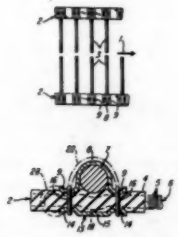
Andreas Jäger, Burgdorf, and Friederich Röhrs, Celle, both of Fed. Rep. of Germany, assignors to Arnold Jäger, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,365

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815115; Feb. 6, 1989, 3903475

Int. Cl.[4] F16G *1/00*; B65G *15/30*

U.S. Cl. 474—237 **27 Claims**



1. In a belt with rods for a rod belt conveyor, especially of an agricultural machine, in particular a harvesting machine, with said belt having two or more circumferential, flexible, inextensible bands that are interconnected by rods of steel or the like that are spaced from one another and extend transverse to the circumferential direction of said bands, and with said rods having ends that are secured to said bands by securing means that extend through said bands, the improvement comprising:

bands that are in a non-prepared state, not having any special holes or the like provided therein for securing means;

holder means, with a respective holder means extending about each of said rod ends; and

securing means in the form of clamps, with each of said holder means being held in place about its associated rod end via said clamps, which are adapted to be forced into said non-prepared bands.

4,892,510

V-RIBBED BELT AND THE METHOD OF MANUFACTURING THE SAME

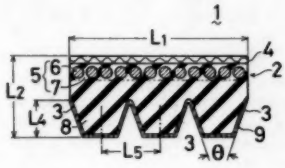
Hiroshi Matsuoka, and Masaki Ochiai, both of Osaka, Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Division of Ser. No. 855,978, Apr. 25, 1986, Pat. No. 4,747,812.

This application Nov. 24, 1987, Ser. No. 124,524

Int. Cl.[4] F16G *1/10*

U.S. Cl. 474—252 **6 Claims**



1. A V-ribbed belt having a plurality of ribs on a belt base along the lengthwise direction of said belt, each of said ribs being formed solely of rubber and having at the outer surface thereof a surface layer molded thereon and vulcanized thereto of a non-woven fabric having a thickness from about 0.01 to about 0.3 mm.

4,892,511

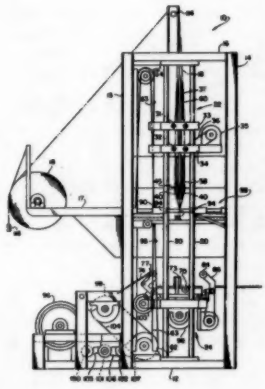
METHOD AND APPARATUS FOR THE AUTOMATIC MANUFACTURE OF FLAT BOTTOM BAGS

Robert A. Luciano; Lawrence W. Luciano, both of Lebanon; Don H. Rowe, Westfield, all of N.J., and Violet M. Hanson, 14 Fairway Dr., Old Bethpage, N.Y. 11804, assignors to Violet M. Hanson, Old Bethpage, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,859

Int. Cl.[4] B31B *33/28*

U.S. Cl. 493—194 **22 Claims**



1. In a machine for making and folding open top flat bottom bags from a heat sealable material comprising,

bag forming means on said machine for forming in the material, opposed faces and opposed sides and a flat bottom for a bag including said opposed faces and sides,

means on said machine supplying a continuous length of heat sealable material to said bag forming means,

closure sealing means on said machine for forming a closure seal on said material,

material severing means on said machine for severing a

length of said material to form the open top of the flat bottom bag,

folding means on said machine having bag bottom sealing means for sealing opposed portions of the opposite sides to the flat bottom, and said folding means and forming means being adjacent for engaging therebetween the opposed sides and bottom of the bag while said bottom sealing means seals portions of the opposed sides to the flat bottom of the bag, and said folding means having means for removing the severed length of material from said bag forming means while folding the flat bottom of the bag alongside an extent of the severed length of the material.

4,892,512

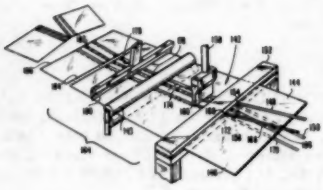
METHOD OF MAKING RECLOSABLE FLEXIBLE CONTAINERS HAVING FASTENER PROFILES AFFIXED TO EXTERIOR OF BAG WALLS

Mark Branson, Shelbyville, Ind., assignor to KCL Corporation, Shelbyville, Ind.

Division of Ser. No. 796,632, Nov. 8, 1985, abandoned. This application Aug. 11, 1987, Ser. No. 84,310

Int. Cl.[4] B31B *23/90, 23/72*

U.S. Cl. 493—194 **4 Claims**



1. A method of manufacturing flexible reclosable containers comprising:

advancing a double web of plastic material having a first layer and a second layer, said first layer having a top which faces away from said second layer, said second layer having a bottom which faces away from said first layer;

advancing a first fastener profile into proximity with the top of said first layer of plastic film and outboard of said layers;

advancing a second fastener profile into proximity with the bottom of said second layer of plastic film and outboard of said layers;

said first and second fastener profiles adapted to be selectively interlocked and having portions which are selectively interlockable;

aligning said first and second fastener profiles with said first and second layers of plastic material;

guiding said first fastener profile into contact with the top of said first layer of said plastic film and outboard of said layers;

guiding said second fastener profile into contact with the bottom of said second layer of said plastic film outboard of said layers with the selectively interlockable portions of said second profile facing the selectively interlockable portions of said first profile;

intermittently sealing said fastener profiles to said first and second layers of said plastic film; and

intermittently sealing sections of said first and second layers of plastic film into bag-shaped containers.

4. A method of making multiple plastic bags with reclosable fasteners thereon comprising:

continuously feeding a continuous strip of thermoplastic film having a rear wall portion and a front wall portion;

continuously feeding one or more rear fastener strips onto the exterior of said rear wall portion;

continuously feeding one or more front fastener strips onto the exterior of said front wall portion, each of said front fastener strips being aligned in parallel to a rear fastener strip; and

simultaneously sealing said front and rear fastener strips to said exterior of said front wall and rear wall portions respectively, and

applying a roller against said front fastener strips so as to cause said front fastener strips to press against and interlock with said rear fastener strips, said front and back walls of said thermoplastic film being interposed therebetween.

4,892,513

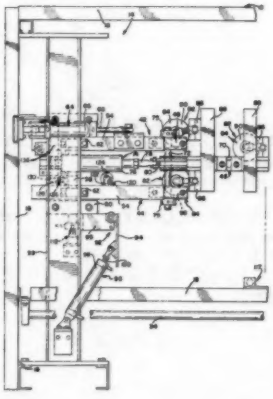
CARTON ERECTOR APPARATUS

Adam Kwiek, Chicago, Ill., assignor to Durable Packaging Corporation, Chicago, Ill.

Filed Jan. 30, 1989, Ser. No. 304,328

Int. Cl.[4] B31B *1/00, 5/74*

U.S. Cl. 493—316 **8 Claims**



1. A carton erecting apparatus for setting up cartons that are supplied to the apparatus as knocked-down carton blanks having side and end panels and top and bottom flaps formed integral therewith; said apparatus comprising: a carton blank storage section having a magazine means for storing and urging knocked-down carton blanks in a substantially vertical orientation with their bottom flaps lowermost towards a carton setup section located adjacent to said carton blank storage section; said carton setup section including a carton opening assembly for receiving a carton blank from said magazine means in a substantially vertical orientation and setting up said carton in a tubular form, said carton opening assembly having a folding arm and a pivot arm, said folding arm being secured to a first substantially vertical shaft and movable between a first position generally parallel to the side panel of said knocked-down carton blank in said magazine means and a second position generally perpendicular to the side panel of said knocked-down carton blank, said pivot arm being secured to a second substantially vertical shaft pivotally secured to said folding arm and movable between a first position substantially parallel to said folding arm and a second position substantially perpendicular to said folding arm, said carton assembly having a first means for moving said folding arm between its first and second positions and a second means for moving said pivot arm between its first and second positions; a first grasping means associated with said pivot arm for grasping a side panel of said carton blank from said magazine means when said pivot arm

and said folding arm are in their respective first positions such that upon subsequent movement of said pivot arm and said folding arm into their respective second positions an end panel of said carton blank contacts said folding arm urging said carton blank into a setup tubular form; a second grasping means mounted to said folding arm and movable therewith for grasping said end panel of said carton when said folding arm is in its second position and a third grasping means mounted to said folding arm and movable therewith for grasping the other side panel of said carton when said folding arm is in its second position, said second and third grasping means cooperating with said first grasping means to cradle said carton and maintain it in its setup tubular form; and bottom flap folding means for infolding the bottom flaps of the setup carton.

4,892,514

BAG AND TUBE FOLDING METHOD AND APPARATUS

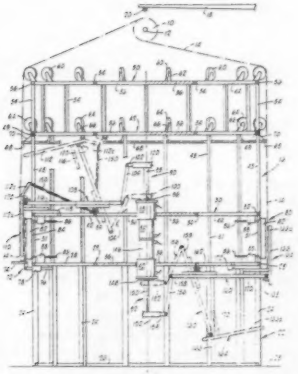
William C. Johnson, Omaha, Nebr., assignor to Rand Farm Systems Inc., Adrian, Mo. and Poly Farm, Inc., Grapevine, Tex., a part interest

Continuation of Ser. No. 697,210, Jan. 31, 1985, Pat. No. 4,775,359. This application Oct. 3, 1988, Ser. No. 253,195

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[4] B65H *45/107;* B31B *39/52*

U.S. Cl. 493—413 **1 Claim**



1. An apparatus for folding flexible tubular material, comprising:

a frame having an upper end and a lower end;

a plurality of fold-supporting surfaces mounted circumferentially about the frame adjacent the lower end thereof for supporting successive folds of flexible tubular material;

an array of first clamping fingers each extending radially outwardly from the frame below the fold-supporting surfaces at spaced apart locations for movement from a retractive position into an extended position to grip the flexible tubular material against the fold-supporting surfaces;

an array of second clamping fingers each extending radially from the frame above the fold-supporting surfaces at spaced apart location for movement from a retracted position into an extended position to fold the flexible tubular material downwardly about the extended first clamping fingers and to grip the fold against the fold-supporting surfaces;

upper actuating means for selectively pivoting the second clamping fingers between their extended and retracted positions;

lower actuating means for selectively pivoting the first clamping fingers between their extended and retracted positions;

the array of second clamping fingers and the array of first clamping fingers engaging the fold-supporting surfaces at alternate intervals;

means for supporting a quantity of flexible tubular material above the second clamping fingers; and

a guide assembly for guiding material from the material-supporting means to the fold supporting surfaces about the upper end of the frame.

4,892,515

ARTIFICIAL RIBBONED FLOWER MAKING METHODS AND APPARATUS

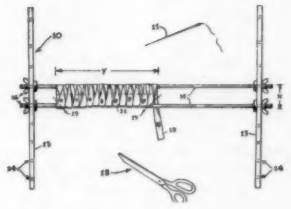
Pamela S. Stiegeler, 800 Johnson St., Box 1290, Coos Bay, Oreg. 97420

Filed Jul. 14, 1988, Ser. No. 219,034

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] D04D *7/00*

U.S. Cl. 493—956 **7 Claims**



1. A method of fabricating a variety of artificial flowers from ribbon material wherein said variety of artificial flowers includes: closed rosebuds; crysanthemums; closed cap mums; pom pon mums; dahlias, daisies, open roses; gladiolas; violets; poinsettias; bachelor buttons; carnations; azaleas; and hyacinth; wherein the materials required to practice the basic method comprise: ribbon material having diverse lengths, finishes, and widths; needle and thread; and, choosing a selected one among a plurality of open generally flat elongated framework members; wherein, each of the plurality of framework members consists of a side element and a pair of parallel arm elements of variable spacing "X" that project outwardly from the one side element; wherein the basic method steps comprise:

(a) choosing a selected one of said variety of artificial flowers;

(b) choosing a ribbon material having a selected length, finish, and width corresponding to choice (a);

(c) selecting an open framework member from among said plurality of framework members having the outboard edges of the arm elements disposed a predetermined distance "x" apart in accordance with choice (a);

(d) wrapping the length of ribbon around the arm elements a number of times "y", and in accordance with a selected one of the following wrapping patterns: (1) straight wrap; (2) overlapping wrap; and (3) twisted wrap; wherein the beginning and end of each completed wrap are temporarily secured together;

(e) selecting among a needle and thread, and staples and thread to form a selected pattern across the ribbon wrap; while the ribbon is still wrapped around the arm elements; wherein the patterns comprise stitched and non-stitched versions including: (1) a straight stitch; (2) a single gather stitch; (3) a double gather stitch; (4) a plurality of tacking stitches; and, (5) a plurality of staples;

(f) removing the ribbon wrap from the open framework member.

4,892,516

SURGICAL AID

Anton Härle, Münster-Roxel, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

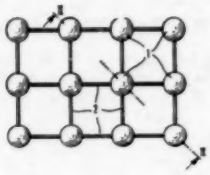
PCT No. PCT/EP83/00092, § 371 Date Jan. 9, 1984, § 102(e) Date Jan. 9, 1984, PCT Pub. No. WO83/03967, PCT Pub. Date Nov. 24, 1983

PCT Filed May 29, 1983, Ser. No. 598,546

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217109

Int. Cl.[4] A61B *17/18*

U.S. Cl. 604—57 10 Claims



1. A surgical aid, capable of being incorporated into soft tissue wounds, the surgical aid comprising a pharmaceutically active compound retained in a support structure, the surgical aid permitting protracted release of the active compound, the support structure being configured as a flat article provided with individual free spaces, each individual free space having an area of at least 0.1 cm^2, the total area of the free spaces comprising at least 60 percent of the area of the flat article.

4,892,517

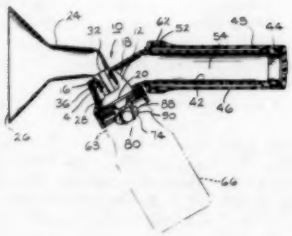
BREAST PUMP

Arthur H. Yuan, Hudson, Ohio, and Michael S. Joss, Chicago, Ill., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Apr. 11, 1988, Ser. No. 179,822

Int. Cl.[4] A61M *1/06*

U.S. Cl. 604—74 6 Claims



1. A breast pump for extracting milk from a mother's breast comprising:

a central manifold having a cavity and a plurality of openings;

a horn for coupling a mother's breast to be milked with the cavity of the manifold, the horn being symmetric about a first axis over the majority of its extent, the horn also having a projection rotatably positioned within one of the openings, the projection being symmetric about a second axis at an angle with respect to the first axis for varying the angular position of the horn with respect to the manifold for the convenience of the mother;

a first fixed cylinder formed integrally with a second opening of the manifold;

a second cylinder reciprocatingly received on the first cylinder for effecting a pumping action therebetween to create reduced pressure in the space within the horn, manifold and cylinders;

a third opening within the manifold for coupling of the baby bottle therewith; and

a ball valve located within the third opening whereby when the second cylinder is reciprocated with respect to the first cylinder and a vacuum created in the space within the horn, manifold and cylinders, the ball valve will seal the third opening and bottle from the space of reduced pressure and suck milk from a mother's breast in association with the horn.

4,892,518

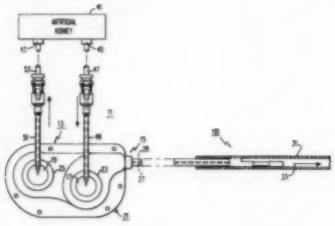
HEMODIALYSIS

James R. Cupp, Indiana; Robert D. Norman, Clymer; David L. Purdy, Marion Center, all of Pa., and Orlando Maytin, Lauderdale Lakes, Fla., assignors to Biocontrol Technology, Inc., Indiana, Pa.

Filed Dec. 4, 1987, Ser. No. 128,890

Int. Cl.[4] A61M *11/00*

U.S. Cl. 604—93 17 Claims



1. A hemodialysis port assembly including a port structured for complete subcutaneous implantation in a patient, septum means in said port, an inlet hypodermic needle and an outlet hypodermic needle to penetrate said septum means, said port assembly also including a catheter assembly connected to said septum means, said catheter assembly to be implanted in said patient with its distal end injected into a blood vessel of said patient, said catheter assembly including a first channel, to to connected to said inlet needle to pass detoxified blood from said inlet needle to said blood vessel, and a second channel conducting fluid separately from said first channel, to be connected to said outlet needle, to pass toxified blood from said blood vessel to said outlet needle, said first channel and said second channel being structured in said catheter so as to permit both said channels to be injected into a common blood vessel in transmission communication with the blood in said blood vessel, and valve means connected to each said channel for gating the flow of detoxified blood into said blood vessel and toxified blood out of said blood vessel.

4,892,519

STEERABLE PERFUSION DILATATION CATHETER

Ronald W. Songer, and Peter R. McInnes, both of Sunnyvale, Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Dec. 3, 1987, Ser. No. 128,154

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—96 5 Claims

1. A steerable dilatation catheter for use in coronary angioplasty, comprising:

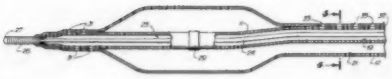
(a) an outer tubular member having proximal and distal portions and having an inflatable balloon toward the distal end thereof;

(b) an inner tubular member disposed within the outer tubular member having an inner lumen and proximal and distal

portions and generally defining an annular passageway with the outer tubular member for inflation and deflation of the balloon, the distal portion of the inner tubular member extending through and beyond the interior of the balloon;

(c) means sealing the sidewalls of the distal ends of the inner and outer tubular members together adjacent the distal end of the balloon to close the distal end thereof with at least one perfusion passageway passing through the sealed distal ends and being in fluid communication with the inner lumen of the inner tubular member;

(d) means sealing the sidewalls of the inner and outer tubular members together at an eccentric location along one side



thereof adjacent the proximal end of the balloon without substantial obstruction of the inflation/deflation passageway

with at least one perfusion passageway extending through the sealed sidewalls of the inner and outer tubular members. said passageways being in fluid communication with the inner lumen of the inner tubular member for carrying blood therethrough to the perfusion passageways passing through the sealed sidewalls of the distal ends of the inner and outer tubular members; and

(e) a guidewire extending through and fixed within the innez lumen in the inner tubular member with a distal portion of the guidewire extending beyond the distal end of the tubular members.

4,892,520

FINGER MOUNTED SURGICAL NEEDLE GUIDE/NEEDLE PROTECTOR

James H. Gilbaugh, 2902 SW. Canterbury La., Portland, Oreg. 97201

Continuation-in-part of Ser. No. 218,229, Jul. 13, 1988. This application Aug. 1, 1988, Ser. No. 226,796

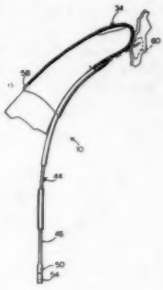
Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—117 **8 Claims**

1. A finger-mount guide for a surgical needle comprising

an elongate, finger-mountable, body having proximal and distal ends with an open lumen extending between said ends for receiving, freely and slidably, such a needle, and

an elongate, flexible, touch-sensitive, glance-protective attaching ribbon joined to said body adjacent, and extendible from, the latter's said distal end adjacent one side of the distal end of said lumen, adapted for folding longitudinally smoothly around the end of the user's finger with the guide in place on the finger, thus to promote, for the user,



touch sensitivity, and finger/needle protectivity, during a guided surgical procedure.

4,892,521

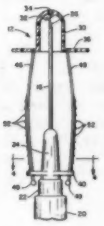
PROTECTIVE COVER FOR HYPODERMIC NEEDLE

Joseph P. Laico, New City, and Joseph L. Molino, Valley Cottage, both of N.Y., assignors to Lincoln Mills, Inc., New City, N.Y.

Filed Aug. 3, 1988, Ser. No. 227,756

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—192 **12 Claims**



1. A protective hypodermic needle cover assembly comprising:

hypodermic needle means comprising a mounting base and a needle connecting said base and terminating in a sharpened point axially spaced from said base, said base comprising a transversely projecting guide means defining a pair of apertures;

protective shield means mounted to said base for protectively shielding said needle point in an extended protective position, said shield means comprising a cap-like member defining a needle opening, said needle extending through said opening to expose said needle point in a retracted position; and

a pair of guide rods extending from said protective shield means and received in said apertures so that the rods move through said apertures when the protective shield means is displaced from the retracted to protective positions, said rods connecting said protective shield means to said hypodermic means in the protective position.

4,892,522

DEVICE FOR PREVENTING INJURY WHEN CAPPING INJECTOR NEEDLE AFTER USE

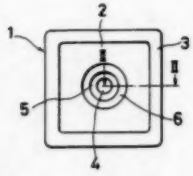
Tsuyoshi Suzuki, Tokyo, and Shoji Kudoh, Noda, both of Japan, assignors to Seirin Kasei Co., Ltd., Shimizu, Japan

Filed Jun. 14, 1988, Ser. No. 206,365

Claims priority, application Japan, Jun. 17, 1987, 62-93108[U]; Jan. 13, 1988, 63-1986[U]; Jan. 13, 1988, 63-1987[U]

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—192 **10 Claims**



1. A device for use with a tubular cap for an injection needle, comprising a plate shaped member made of a synthetic resin material and having a plane when assembled on the cap that extends substantially transverse to the axis of the tubular cap, said plate member comprising an outer peripheral wall portion having an axial thickness that provides the plate shaped member with the required strength and an inner wall portion integral with the outer portion and having a thickness smaller than the thickness of the outer peripheral portion, said inner wall portion having an inner edge defining an opening having an inner diameter which is smaller than the outer diameter of the cap near the end where the needle is to be inserted, a first thin-walled portion and a second thin-walled portion having a thickness larger than that of the first thin-walled portion, the inner wall portion of the plate shaped member elastically flexing as the cap is inserted through the opening in the plate-shaped member with the inner edge of the opening gripping the outer surface of the cap to hold the plate in place.

4,892,523

SHIELDED SAFETY SYRINGE

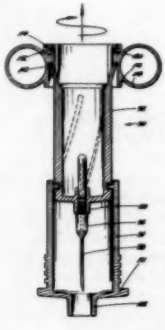
Terry Haber, Lake Forest; Clark B. Foster, El Toro, and William H. Smedley, Lake Elsinore, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Division of Ser. No. 43,042, Apr. 27, 1987, Pat. No. 4,758,231.

This application Jul. 11, 1988, Ser. No. 217,369

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—198 **4 Claims**



1. A shielded syringe assembly comprising an inner syringe cylinder having an open proximal end and a substantially closed distal end, a hypodermic needle supported at and extending outwardly from said distal end, and an outer protective sleeve having an open proximal end and an opening in a substantially closed distal end, said outer sleeve coaxially aligned with and axially advanceable relative to said inner cylinder from a retracted position, where said needle projects outwardly through the opening in said sleeve, to an extended position, where said needle is located within and completely surrounded by said sleeve;

said inner cylinder having at least one groove extending between the proximal and distal ends thereof; and

said outer sleeve having at least one bump extending therefrom for receipt within the groove of said inner cylinder;

said bump riding through said groove from the proximal to the distal ends of said inner cylinder when said outer sleeve is advanced axially from the retracted to the extended position relative to said inner cylinder to thereby releaseably retain said outer sleeve in the extended position with said needle shielded by said sleeve.

4,892,524

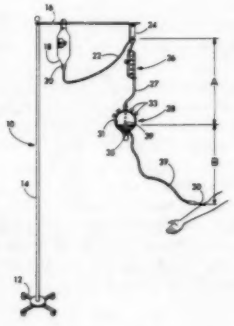
INTRAVENOUS ADMINISTRATION SYSTEM

Gordon Smith, 1320 Pinehill Dr., Jefferson, Tex. 75657

Filed Oct. 30, 1987, Ser. No. 115,424

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—246 **16 Claims**



1. An apparatus for administering a liquid to a patient comprising:

(a) at least one container for holding liquid suspended elevated above the patient;

(b) a passive metering device located a sufficient distance from the container to effect a substantial hydrostatic head pressure, the passive metering device containing at least one restricted orifice through which fluid may flow, the metering device located below the container;

(c) a regulator having a fluid chamber and an air-tight exit valve comprising means to obstruct air flow therethrough, the regulator located a pre-selected distance below the container;

(d) first flexible tubing connecting the container to the regulator with the metering device located therebetween so that constant volumetric flow from the container to the regulator is assured by the combination of constant hydrostatic pressure drop from the container to the regulator and the restricted flow through the metering device; and

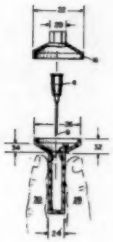
(e) second flexible tubing connecting the output of the regulator to the patient so that instantaneous fluid flow to the patient is determined by the head pressure from the regulator to the patient.

4,892,525

HYPODERMIC NEEDLE PROTECTIVE BARREL AND CAP PACKAGING

William J. Hermann, Jr., Sealy, and John R. Zanek, Missouri City, both of Tex., assignors to Synertex, Missouri City, Tex.

Filed Jan. 18, 1984, Ser. No. 571,779
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—263 **14 Claims**



1. In a protective barrel and cap packaging for enclosing a hypodermic needle, which is attached to hub at a proximate and extends axially to a distal end, wherein said packaging consists essentially of the combination of an axially extending protective barrel and a protective cap, wherein said barrel has an open end and a closed end, said open end being adapted to accept entry of a needle tip and frictionally engage about an outer surface of a needle hub, and said barrel closed end being adapted to surround a needle tip inserted therein, wherein further said protective cap has an open end and a closed end, said cap open end being adapted to engage with said barrel open end thereby to define an enclosure for any needle therewithin, the improvement comprising:

a needle entrance guide means attached to said barrel open end and extending laterally and axially therefrom to define a laterally enlarged barrel opening with a transition ramp surface into the barrel open end, and towards the barrel closed end to guide a laterally misaligned needle tip axially into said protective barrel open end, said ramp surface making an included angle with the axial centerline of said barrel which is greater than 45 degrees and defining an obverse ramp outer surface between said enlarged barrel opening and said barrel outer surface which has a lateral projected width greater than 0.5 cm. and wherein a laterally enlarged cap open end is defined to engage with said laterally enlarged barrel opening, thereby to define said enclosure, whereby the obverse surface to said ramp surface encourages a user's fingers to locate behind the ramp and around a barrel outer surface which is proximate the barrel open end.

4,892,526

SURGICAL IRRIGATION APPARATUS

H. William Reese, 3214 S. River Rd., Tempe, Ariz. 85282

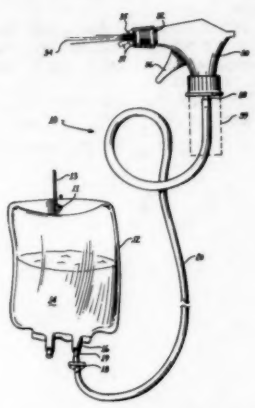
Filed Aug. 18, 1988, Ser. No. 234,029
Int. Cl.[4] A61M *7/00*
U.S. Cl. 604—290 **1 Claim**

1. A method, for providing sufficient quantities of irrigation fluid onto exposed tissue during surgical procedures, comprising the following:

providing a plastic intravenous bag having a suitable fluid located within an inner evacuable chamber, a puncturable and sealable outlet opening, and a means attached to said bag for holding the bag in any desired elevated position;

drawing the fluid from the intravenous bag through a fluid conduit made of flexible tubing, said conduit having a hollow lance coupling device for insertion into said outlet opening of said intravenous bag;

drawing the fluid from said intravenous bag into said conduit to pump spray means which emits a spray of the fluid; and



providng a multi-directional adapter at the outlet of said pump spray means to selectively direct the spray of the fluid in various directions while maintaining the pump spray means in one position.

4,892,527

SPORTMAN'S REUSABLE, ANTI-COLLAPSING URINE COLLECTION DEVICE

Zbig Z. Zivny, 104 Wintergreen Hill, Painesville, Ohio 44077

Filed Sep. 10, 1987, Ser. No. 95,174
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—353 **13 Claims**

1. A reusable urine containment device comprising:

a holster,

a reservoir tube contained within the holster,

means for preventing the collapse of the reservoir tube in response to outside pressure having a magnitude that a leg of a wading fisherman would experience, said anticollapse structure maintaining said magnitude even if wet, said means comprising an anti-collapse structure contained within the reservoir tube, and

means for securing the containment device in operating position.

4,892,528

DISPOSABLE DIAPER

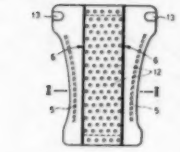
Migaku Suzuki, Kawanoe; Mitsuzo Ochi, Ehime, and Takeshi Kudo, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation of Ser. No. 69,181, Jul. 1, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 269,298

Claims priority, application Japan, Jul. 4, 1986, 61-158609; Aug. 20, 1986, 61-194500

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385.2 9 Claims



1. A disposable diaper comprising in combination

(a) a thick absorbent core (1) having a top surface, a bottom surface and two side surfaces,

(b) a top sheet (2) extending over both the top surface and the two side surfaces of said absorbent core (1), the portion of said top sheet (2) that extends over the top surface of said absorbent core (1) being water-permeable,

(c) a water-impermeable backsheet (3) extending over the major portion of the bottom surface of said absorbent core (1) and having two lateral portions that extend laterally outwardly from the sides of said absorbent core (1),

(d) two sheets (7) resistant to the passage of water disposed adjacent to and at least partially outwardly from the two side surfaces of said absorbent core,

(i) the outer portion of each of said sheets (7) being joined to the portions of said water-impermeable backsheet (3) that extend laterally from the sides of said absorbent core (1) so that together they form side flaps (4),

(ii) the inner portion of each of said sheets (7) being formed into the general shape of an inverted "U" (8) that has the two ends of the "U" facing toward said backsheet (3) with one section of said inner portion being disposed in a parallel relationship to and in close proximity to the portion of said top sheet (2) that extends along the sides of said absorbent core (1), said inverted "U" portion (8) extending above said backsheet (3) to a point which is above the top surface of said absorbent core (1) so as to form a leakage-protecting baffle (6) that extends above the top surface of said absorbent core (1),

(e) a length of elastic material (9) disposed within the inverted "U" inner portion (8) of each of said sheets (7), and

(f) an elongated elastic band (5) joined to each side flap (4).

4,892,529

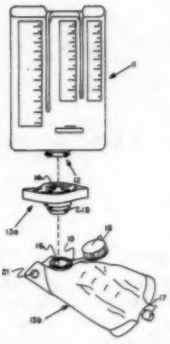
METHOD OF AUTOLOGOUS TRANSFUSION

Michael A. Valerio, Wallingford, Conn., assignor to Sherwood Medical Company, St. Louis, Mo.

Continuation of Ser. No. 923,058, Oct. 24, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 268,666

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—317 6 Claims



1. A method of autologously transfusing a patient which comprises:

(a) collecting blood from the chest cavity of the patient in the collection bottle of an underwater drainage device for the chest cavity;

(b) detaching the collection bottle from the underwater drainge device;

(c) placing in fluid-tight communication with the blood collected in the collection bottle, a transfer blood bag having first and second ends and a means at the second end thereof to be placed in fluid-tight communication with an infusion set for the patient;

(d) transferring the collected blood from the collection bottle to the transfer bag through the first end of said transfer bag; and

(e) allowing the blood collected in the transfer bag to be infused into the patient through the infusion set.

4,892,530

OSTOMY COUPLING

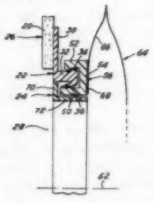
Peter L. Steer, Surrey, England, assignor to Edward Weck Incorporated, Princeton, N.J.

Continuation of Ser. No. 936,056, Nov. 28, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 142,351

Claims priority, application United Kingdom, Dec. 10, 1985, 8530369

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—338 1 Claim



1. An ostomy appliance intended for attachment to a peristomal area of a wearer including a pad of medical -grade skin-

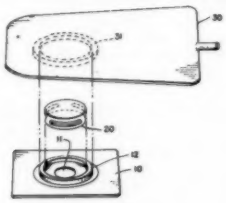
attachable adhesive material, a first coupling element secured thereto, the element having an extending flange attached to a surface of the pad and an upstanding rib of closed loop form constructed to couple with a counterpart second coupling element on a bag or pouch having a stomal orifice, said second coupling element comprising inner and outer parallel spaced apart upstanding walls which form a channel surrounding the stomal orifice to accept the upstanding rib of the first coupling element and a separate inner chute member located radially within and adjacent to the first coupling element, the chute member having a substantially cylindrical wall covering the whole of the radially inner surface of the first coupling element and, at one of its ends, a radially outwardly extending flange positioned to be engaged under the end of the inner wall of said second coupling element said chute member is trapped when the two coupling elements are coupled together.

4,892,531

ANTI-SEAL DEVICE FOR USE WITH OSTOMY APPLIANCES

Jack L. Metz, deceased, late of Des Plaines, Ill., and by Florence Metz, executrix, 469 Oak St., Des Plaines, Ill. 60016, assignors to Florence Metz, Des Plaines, Ill.

Filed Sep. 11, 1987, Ser. No. 95,212
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—340 **3 Claims**



1. An improved ostomy appliance for collecting waste material emitted from a human body through a stoma, said appliance comprising:

a diaphragm having an aperture adapted to permit the stoma to enter and project slightly therethrough;

first means for attaching said diaphragm to the body;

a pouch having an inner wall and an outer wall, said walls being joined along peripheral edge margins thereof for storing body waste materials emitted from the stoma, said inner wall having an opening to allow the entrance of the waste material into said pouch, said pouch opening being in register with said diaphragm aperture;

second means for attaching said pouch to said diaphragm so as to define a passageway adapted to allow the passage of the waste material from the stoma into said pouch;

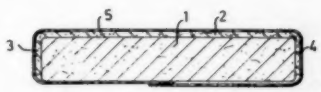
a cup-like anti-seal device located within said pouch between said outer wall and said diaphragm and having a completely closed end which faces said pouch outer wall, a cylindrical side wall peripherally secured at one end thereof to said closed end, said side wall having at least one opening therein and a thickness sufficient to maintain said outer pouch wall away from the stoma, said side wall defining an open end of said device opposite said closed end, said open end positioned within said pouch to contact said diaphragm, to be inserted into said opening and to circumscribe the stoma so as to maintain said outer wall away from the stoma, such that externally applied pressure to said closed end is conveyed around the entire periphery of the stoma and the stoma is protected from direct impact.

4,892,532

DISPOSABLE LIQUID-ABSORBING ARTICLE

Lars Boman, Mölndal, Sweden, assignor to Molnlycke AB, Gothenburg, Sweden

PCT No. PCT/SE87/00250, § 371 Date Dec. 29, 1987, § 102(e) Date Dec. 29, 1987, PCT Pub. No. WO87/07117, PCT Pub. Date Dec. 3, 1987
PCT Filed May 20, 1987, Ser. No. 150,406
Claims priority, application Sweden, May 27, 1986, 8602413
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—366 **6 Claims**



1. A disposable liquid-absorbing article such as a diaper, a sanitary napkin or the like comprising an absorption body (1), a casing (5) surrounding said body (1) and having a portion adapted to face the user of the article, said casing (5) being liquid permeable at least in its portion adapted to face the user of the article, characterized in that the liquid-permeable portion of the casing (5) consists of a thin, spun-bonded fibrous fabric layer composed of a hydrophobic material, and in that a similarly constructed hydrophobic fibrous layer of melt-bonded fiber fabric is applied between said casing portion and the absorption body, the latter said layer (2) having a weight per unit area which is greater than that of said casing portion.

4,892,533

ULTRAHIGH WATER-ABSORBING FIBER-FORMING COMPOSITION

Bi Le-Khac, West Chester, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Division of Ser. No. 834,075, Feb. 26, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,634
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—368 **20 Claims**

1. A stable, heat curable, aqueous composition comprising in weight percent:

(a) from about 80 to about 99.5 of a copolymer containing from about 25 to about 75 mole percent of about 20 to about 80 percent neutralized carboxylic acid substituted ethylenic units and from about 75 to about 25 mole percent recurring units of at least one copolymerizable comonomer; and

(b) at least one heterocyclic carbonate compound wherein the resulting aqueous composition is uncured and stable at room temperature.

4,892,534

NONWOVEN WEB USEFUL AS A BODYSIDE LINER FOR AN ABSORPTION ARTICLE

Paul J. Datta, and Gary C. Anderson, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 30, 1988, Ser. No. 292,600
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—370 **22 Claims**

10. A fluid permeable, nonwoven web useful as a bodyside liner for a feminine pad comprising 3 to 8 layers of thermoplas-

tic filaments bonded together, said filaments having a denier of between about 4 to 10, web having a basis weight of between

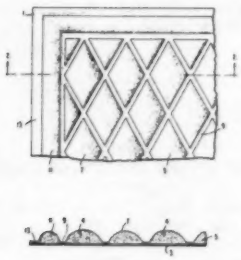
about 0.7 to 1.0 ounces per square yard and a density of between about 150 to 350 meters per cubic centimeter.

4,892,535

ABSORBENT PAD AND METHOD AND APPARATUS FOR MAKING THE SAME

Sten Björnberg, Spanga, and Ove Ahlstrand, älvsjö, both of Sweden, assignors to Landstingens Inköpscentral, Lic, Ekonomisk Förening, Solna, Sweden

Filed Aug. 7, 1987, Ser. No. 82,725
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—380 5 Claims



1. An absorbent pad comprising a liquid-impervious back sheet, a plurality of bodies of liquid-absorbent material disposed on one surface of the back sheet, and a liquid-pervious cover sheet covering said bodies of absorbent material and directly secured to the back sheet along lines which separate said bodies of absorbent material, these lines being substantially free from said absorbent material.

4,892,536

ABSORBENT ARTICLE HAVING ELASTIC STRANDS

Thomas A. DesMarais; Mary E. Freeland, both of Norwood, and William J. Moore, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 2, 1988, Ser. No. 240,149
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.2 14 Claims

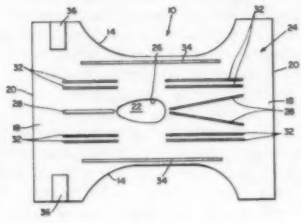
1. A disposable absorbent article having a longitudinal axis, said article comprising:

a urine impervious backsheet;

a urine pervious liner having a front portion, a rear portion and at least one passageway adapted to permit waste materials to pass through said liner, said liner being at least partially peripherally affixed to said backsheet;

an absorbent core intermediate said liner and said backsheet;

a means for contracting said liner in the longitudinal direction, said contracting means being disposed substantially longitudinally nonadjacent said passageway and in the front portion of said liner; and



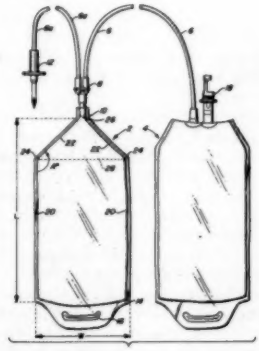
a means for contracting said liner in the longitudinal direction, said contracting means being disposed substantially longitudinally nonadjacent said passageway and in the rear portion of said liner.

4,892,537

BAG FOR SEPARATION AND ISOLATION OF BLOOD COMPONENTS

Raleigh A. Carmen, Concord; Barry S. Leng, Pleasant Hill; Willie J. Lewis, Oakland, and Edward J. Nelson, San Rafael, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 11, 1985, Ser. No. 700,793
Int. Cl.[4] A61B *5/00*; B65D *33/00*
U.S. Cl. 604—408 7 Claims



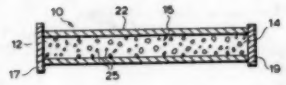
1. A blood bag for separation and isolation of neocyte red blood cells from a mixture of neocyte and gerocyte red blood cells, the bag comprising a generally flat, elongated, edge-sealed polymeric bag having a length to width ratio of at least 2 to 1 and comprising substantially parallel major sides and an upper end portion having two opposite top minor sides extending directly from the major sides and which minor sides are in direct and tapering communication with a connected polymeric tubing such that, when the bag is expanded by the mixture which is then separated into neocytes and gerocytes according to a predetermined density gradient, the upper end portion forms a funnel-like guide adapted for directing the neocyte red blood cells from the bag and through the tubing in a substantially unobstructed manner.

4,892,538

IN VIVO DELIVERY OF NEUROTRANSMITTERS BY IMPLANTED, ENCAPSULATED CELLS

Patrick Aebischer; Shelley R. Winn, and Pierre M. Galletti, all of Providence, R.I., assignors to Brown University Research Foundation, Providence, R.I.

Filed Nov. 17, 1987, Ser. No. 121,626
Int. Cl.[4] A61K *9/22*
U.S. Cl. 604—891.1 **24 Claims**



1. A method of delivering a neurotransmitter to a subject afflicted with a neurotransmitter deficiency comprising the steps of:

encapsulating at least one neurotransmitter-secreting cell within a semipermeable membrane, said membrane allowing the diffusion of the neurotransmitter therethrough while excluding viruses, antibodies and other detrimental agents present in the external environmental; and

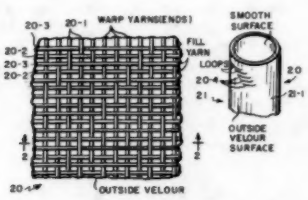
implanting said encapsulated cell into a target region within a subject's brain, such that the encapsulated cell secretes the neurotransmitter and thereby provide constitutive delivery of the neurotransmitter to the target region to treat the deficiency.

4,892,539

VASCULAR GRAFT

Durmus Koch, Demarest, N.J., assignor to D-R Medical Systems, Inc., Northvale, N.J.

Filed Feb. 8, 1988, Ser. No. 152,978
Int. Cl.[4] A61F *2/06, 2/04;* D03D *3/02*
U.S. Cl. 623—1 **16 Claims**



1. A vascular graft comprising a seamless tube of crimped woven texturized yarn fabric, said tube having a complete outer velour surface and a smooth inner surface, said outer velour surface having loops open to receive tissue ingrowth formed of fill yarn, each of said loop extending outside of a plurality of warp yarns.

4,892,540

TWO-LEAFLET PROSTHETIC HEART VALVE

Franco Vallana, Turin, Italy, assignor to Sorin Biomedica S.p.A., Saluggia, Italy

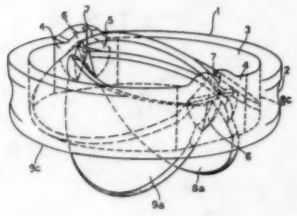
Filed Apr. 20, 1988, Ser. No. 183,774
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 **8 Claims**

1. A prosthetic heart valve for reducing the formation of thrombi comprising:

(a) a base ring adapted to house a suture ring in its exterior for suturing to the heart tissue, wherein said base ring includes an inner surface with walls forming two diametrically opposed recesses which communicate with the exterior, and wherein said recesses include:

(i) an upper portion having a substantially flat surface with an opening therebetween;

(ii) a lower portion separated into two spherical bottom surfaces by a separator body wherein said separator body extends from said lower portion of said recess and said separator body comprises a wedge shape to provide an opposing recess portion on each side of said separator body; and



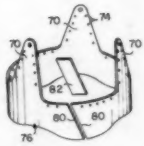
(b) two leaflets having an open position and a closed position for regulating the flow of blood in one direction wherein each of said leaflets has a pair of tongues with one tongue on each side of each leaflet positioned in a recess portion of each of said opposing recesses, and wherein said tongues of said leaflets have continuously changing point contact with the walls of said opposing recesses when said leaflets move between said open position and said closed position for preventing the formation of thrombi as the blood flows from and through said recesses.

4,892,541

HEART VALVE PROSTHESIS

Manuel T. Alonso, Newport Beach, Calif., assignor to Tascon Medical Technology Corporation, Minneapolis, Minn.

Division of Ser. No. 664,150, Oct. 24, 1984, Pat. No. 4,680,031, which is a continuation-in-part of Ser. No. 445,259, Nov. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 303,345, Oct. 7, 1982, abandoned. This application Jan. 29, 1987, Ser. No. 8,207
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 **6 Claims**



1. A method of fabrication of a stent for an artificial heart valve comprising:

cutting a plate of metal having a thickness of 0.010 inches or less to produce an elongated stent member having a first end, a second end, a lower edge, and an upper edge, said upper edge provided with three commissural posts extending therefrom;

bending said stent member to place said first end adjacent said second end of said stent member; and

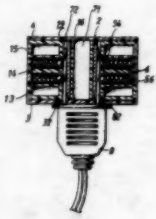
mechanically coupling said first end to said second end of said stent member.

4,892,542

SOCKET

Tian T. Wang, No. 26, Lane 293, Hua Cheng Rd., Hsin Chuang City, Taipei Hsien, Taiwan

Filed Apr. 6, 1989, Ser. No. 333,968
Int. Cl.[4] H01R *13/10*
U.S. Cl. 439—818 **6 Claims**



1. A socket comprising:

a casing having a number of insulating partition plates to form a major configuration of said socket which has two symmetrical lateral sides separated by a plurality of compartments, said compartments being separated by a plurality of vertical insulation partition plates corresponding to prongs of a plug, at least one lateral cylindrical chamber being formed on each lateral side of said casing;

a conducting plate being disposed in two of said compartments which are formed each between a lateral side of said socket and a vertical insulating partition plate, and bearing against said vertical insulating partition in order to form a receptacle between said conducting plate and said lateral side of said socket;

a ball and a spring being disposed in series in each lateral cylindrical chamber;

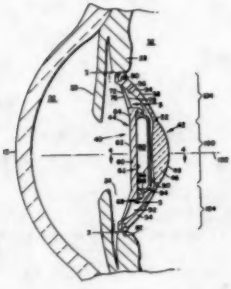
a partition wall disposed on each outer end of said lateral cylindrical chamber for retaining and forcing said spring and said ball into position.

4,892,543

INTRAOCULAR LENS PROVIDING ACCOMODATION

Dana F. Turley, 4651 Prices Creek Rd., Huntington, W. Va. 25701

Filed Feb. 2, 1989, Ser. No. 305,603
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 **14 Claims**



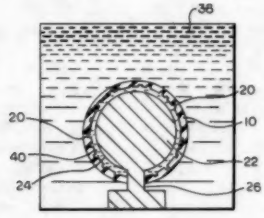
1. An intraocular lens for mounting within the ciliary body of a host eye and capable of emulating the natural process of accommodation comprising first optical means having a first refractive power, second optical means having a variable refractive power, said first and second optical means being connected together for relative movement along the principal axis of lens, said first optical means including a surface of predetermined configuration engageable by said second optical means upon relative movement of said first and second optical means towards each other in response to contraction of the ciliary body to increase the refractive power of the lens.

4,892,544

METHODS FOR FORMING HOLLOW, POROUS-SURFACED ELASTOMERIC BODIES

Eldon E. Frisch, Midland, Mich., assignor to Dow Corning Wright Corporation, Arlington, Tenn.

Filed Mar. 7, 1988, Ser. No. 164,700
Int. Cl.[4] A61F *2/06*; C08J *9/26*; B29C *41/02*
U.S. Cl. 623—11 **20 Claims**



1. A method of making a hollow elastomeric body having a porous surface layer comprising

(a) coating at least a portion of a surface of a mandrel with a coating liquid selected from the group consisting of water, water-and-wetting agent solutions, and water-and-sugar solutions

(b) adhering a layer of water-elutable particles onto the coated mandrel surface,

(c) applying a layer of fluid elastomer composition to the particle-coated mandrel surface, said elastomeric composition capable of forming a water-insoluble elastomer,

(d) causing said elastomeric composition to form a cohesive mass while in contact with said particle-coated mandrel surface,

(e) dissolving said elutable particles from said cohesive mass with a water-based solvent, and

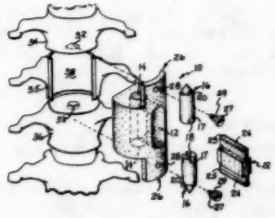
(f) removing said cohesive mass from said mandrel.

4,892,545

VERTEBRAL LOCK

James L. Day, and Richard B. Budde, both of Cincinnati, Ohio, assignors to Ohio Medical Instrument Company, Inc., Cincinnati, Ohio

Filed Jul. 14, 1988, Ser. No. 219,087
Int. Cl.[4] A61F *2/44*
U.S. Cl. 623—17 **9 Claims**



1. A vertebral lock comprising:

(a) a body seatable within a cavity formed by removal of a portion of a vertebra from a spinal column,
(b) a central slot presented by said body,
(c) a pair of guide holes in said body, said guide holes extending substantially perpendicularly from said slot in opposite directions through respective ends of said body,
(d) a retaining pin axially slidably received in and axially guided by each said guide hole, each pin having a pointed tip at an outer end thereof, said tip in use projecting outwardly of said body for engaging a vertebra, each pin having an inner end which extends into said slot; and
(e) locking member insertable into said slot perpendicularly to said pins after said pins have been projected outwardly of said body to positively abut and stop the inner ends of said pins and thereby lock the pins in said guide holes with their tips projecting outwardly of said body.

4,892,546

ADJUSTABLE PROSTHESIS FOR A JOINT BONE

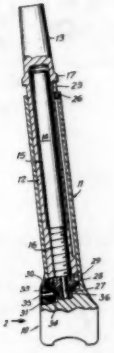
Rainer T. Kotz, Vienna, Austria, and Hans E. Harder, Probsteierhagen, Fed. Rep. of Germany, assignors to Howmedica GmbH, Schoenkirchem, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,570

Claims priority, application Fed. Rep. of Germany, May 15, 1987, 8706999

Int. Cl.[4] A61F *1/00*

U.S. Cl. 623—18 **9 Claims**



1. An adjustable prosthesis for a bone joint, comprising a joint component, an elongated rod having a distal end and a proximal end, a drive trunnion connected to said rod through an angular gear, an elongated inner sleeve, an outer sleeve and means for preventing rotation of said inner sleeve within said outer sleeve, said elongated rod including a threaded spindle and said inner sleeve including a threaded spindle nut which cooperates with said threaded spindle to provide longitudinal adjustment of the inner sleeve relative to the rod, said inner sleeve being telescopically slidable within said outer sleeve but being prevented by said means from rotating within said outer sleeve, said outer sleeve being secured to said joint component, said elongated rod being supported at its proximal end in said joint component for rotation relative to the joint component by said drive trunnion and angular gear, said drive trunnion being rotatably supported in said joint component, and said elongated rod having means for being releasably fixed against said rotation.

4,892,547

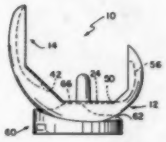
PARTIALLY STABILIZED KNEE PROSTHESIS

David R. Brown, Warsaw, Ind., assignor to Biomet, Inc., Warsaw, Ind.

Filed Feb. 3, 1988, Ser. No. 151,659

Int. Cl.[4] A61F *2/38*

U.S. Cl. 623—20 **15 Claims**



1. A knee joint prosthesis, comprising:
a femoral component, adapted for implantation on the condylar end of the femur, having a pair of spaced-apart condylar bearing portions, an anterior intercondylar portion, a posterior intercondylar portion, and an intercondylar opening between said anterior and posterior intercondylar portions, said femoral component having an interior contour which closely matches an exterior contour of the end of the femur after the femur has been prepared to receive the femoral component, said interior contour being at least partially defined by generally horizontal superior surfaces of the condylar bearing portions and by the intercondylar opening, said intercondylar opening lying in a common plane with, or inferiorly to, said horizontal superior surfaces of the condylar bearing portions; and
a tibial component, adapted for implantation on the tibial plateau, having a pair of spaced-apart bearing surfaces for supporting the condylar bearing portions of the femoral component, and having an intercondylar eminence between the bearing surfaces, said eminence having a posterior side and a peak which defines the highest portion of the tibial component, as measured relative to the tibial plateau;
wherein, the peak of the intercondylar eminence on the tibial component extends into, but not through, and interacts with the intercondylar opening to define a partially stabilized prosthesis, such that resection of the femur to provide clearance for the intercondylar opening and the intercondylar eminence is unnecessary.

4,892,548

JOINT SOCKET

Gino Niederer, Zollikofen, and Otto Frey, Winterthur, both of Switzerland, assignors to Gebruder Sulzer, Winterthur and Protek AG, Bern, both of, Switzerland

Filed Jan. 3, 1983, Ser. No. 454,993

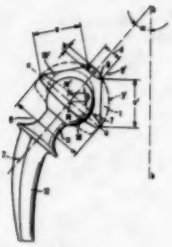
Claims priority, application Switzerland, Jan. 12, 1982, 147/82

Int. Cl.[4] A61F *2/34*

U.S. Cl. 623—22 **6 Claims**

1. A joint socket for receiving a spherical joint head of a hip joint prosthesis, said socket having a non-metallic body with an external surface at least partly of a surface of revolution about a longitudinal axis and an internal hemispherical cavity;
a metallic contrast ring in said surface of said body concentric to said axis; and
a metal measuring ring fixed in said surface in an area opposite and spaced from said cavity and concentric to said axis, said measuring ring being longitudinally spaced from

and parallel to said contrast ring wherein the spacing of said measuring ring from said contrast ring is so great that



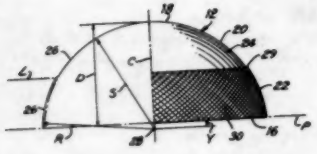
said measuring ring does not lie in the shadow region of a spherical joint head in an X-ray photograph.

4,892,549

DUAL-RADIUS ACETABULAR CUP COMPONENT

Harry E. Figgie, III, Pepper Pike, Ohio; Alfred J. Zarnowski, North Plainfield, and Matthew V. Lyons, Hoboken, both of N.J., assignors to Osteonics Corp., Allendale, N.J.

Filed Jan. 31, 1989, Ser. No. 304,752
Int. Cl.[4] A61F 2/34
U.S. Cl. 623—22 **14 Claims**



1. A shell component for use in an acetabular cup assembly of a prosthetic joint, the shell component having a dual-radius outer surface contour configured for implant into an acetabulum and securement therein by an interference fit, the shell component comprising:

a lower rim;

an apical region spaced upwardly in an axial direction a given distance from the lower rim;

an intermediate location spaced approximately one-half the distance between the lower rim and the apical region; and

an outer surface having a first generally spherical surface portion extending upwardly from the lower rim to the intermediate location, and a second generally spherical surface portion extending upwardly from the intermediate location to the apical region, the first generally spherical surface portion having a radius slightly greater than the radius of the second generally spherical surface portion.

4,892,550

ENDOPROSTHESIS DEVICE AND METHOD

Donald L. Huebsch, 3716 Prestwick Dr., Los Angeles, Calif. 90027

Filed Dec. 30, 1985, Ser. No. 814,690
Int. Cl.[4] A61F 2/32
U.S. Cl. 623—22 **37 Claims**

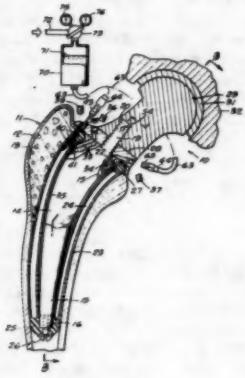
1. A pressurizable elastic endoprosthesis anchoring apparatus freely insertable into a medullary canal and thereafter immovably anchorable thereto comprising:

an elongated load bearing stem;

an elastic member mounted around and extending lengthwise of said stem; and

means for compressing said elastic member radially outward into pressurized contact with the juxtaposed surface of the medullary canal after insertion therein;

the elastic member being fluid impervious and having an internal cavity, and said means for compressing said elastic member including means for introducing a fluent medium under pressure into said cavity to expand said elastic member into pressurized contact with said surface of the medullary canal and to continuously maintain the elastic



member compressed in resilient pressure contact with the medullary canal surface, said elastic member being effective to distribute elastic pressure substantially uniformly to the surface area of the medullary canal in contact therewith and to conform to irregularities present in the juxtaposed surface portion of the medullary canal, said uniformly distributed elastic pressure applied continuously by the elastic member to the medullary canal being effective to anchor said endoprosthesis immovably therein.

4,892,551

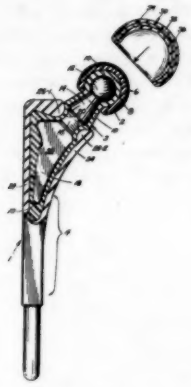
IMPACT DISSIPATING AND LOAD DIVERTING TOTAL HIP ARTHROPLASTY PROSTHESIS

Terry M. Haber, Lake Forest, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Jul. 3, 1986, Ser. No. 881,638
Int. Cl.[4] A61F 2/32
U.S. Cl. 623—23 **15 Claims**

1. An impact dissipating hip arthroplasty prosthesis for interconnecting first and second bones of a patient, said prosthesis having a head portion attached at a first of the patient's bones, and a body portion attached at the second of the bones and having an inwardly extending surface that forms a fulcrum, said prosthesis including a one piece impact dissipating member extending from said head portion to be received within said body portion and supported at said fulcrum, said impact dissipating member being rotatable in a first direction within said body portion and around said fulcrum in response

to an intraskeletal load applied in a second, transverse direction through the patient's first bone so as to redirect and decelerate

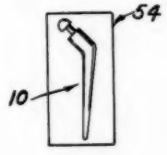


the load and reduce the shock effect of such load on the patient's second bone.

4,892,552
ORTHOPEDIC DEVICE

Robert D. Ainsworth, 118 Castle Hill Ranch Rd., Walnut Creek, Calif. 94595; Thirumalai N. C. Devanathan, 1801 Duncan, Tracy, Calif. 95576, and Steven T. C. Lin, 7100 San Ramon Rd., Dublin, Calif. 94566

Continuation of Ser. No. 595,215, Mar. 30, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 904,592
Int. Cl.[4] A61F *2/32, 2/30*
U.S. Cl. 623—23 **11 Claims**

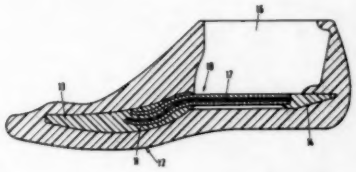


1. In a femoral stem suitable for permanent human implantation into the natural femur, the femoral stem including an elongate shaft extending in an axial direction and having a size and shape for implantation within the medullary canal of the natural femur, and a neck suitable for replacement of the natural femoral neck, the neck being unitary with the shaft and extending from the shaft in a direction angled with respect to the axial direction of the shaft such that the axial direction and the angled direction define a plane to be aligned with the medial-lateral direction upon implant of the femoral stem, the improvement wherein the shaft and the neck are comprised of a number of first uniplanar layers of continuous unidirectional filament carbon fibers and a number of second uniplanar layers of continuous unidirectional filament carbon fibers, with the carbon fibers of each layer extending parallel to one another along a respective axis of orientation and being embedded in a respective matrix of non-biodegradable, bio-compatible thermoplastic polymer, the layers being in a stacked arrangement generally parallel to one another and essentially parallel to said plane, the axis of orientation of the fibers of the first layers being aligned essentially with the axial direction, the axis of orientation of the fibers of the second layers being offset from the axial direction up to $\pm 90°$ relative to the axial direction, at least some first layers alternating with at least some second layers within the stacked arrangement, and wherein the number of first layers in the stacked arrangement of layers is greater than the number of second layers.

4,892,553
ARTIFICIAL FOOT FOR A LEG PROSTHESIS

Gregor M. Prahl, Rullstorf, Fed. Rep. of Germany, assignor to IPOS GmbH & Co, KG, Lüneburg, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,462
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 8804228[U]
Int. Cl.[4] A61F *2/66*
U.S. Cl. 623—55 **13 Claims**

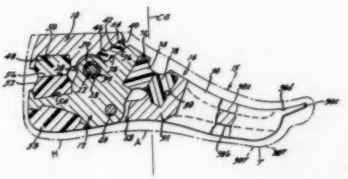


1. An artificial foot for a leg prosthesis comprising a foamed plastic molded foot portion having a ball and plantar area with a plate-shaped, metallic reinforcing member embedded therein which has a section curved so as to extend correspondingly to the ball of the foot so as to support a rolling function of the foot, and an elastic, yielding cushioning forefoot core and a function core consisting of a tab disposed within a heel area, the function core and the reinforcing member being rigidly interconnected, the reinforcing member including at least two superimposed leaf springs of approximately equal length configured to correspond with the rolling profile of the foot, the leaf springs consisting of one of titanium and a high-tensile titanium-aluminum alloy, the at least two leaf springs including a bottom leaf spring and a top leaf spring, the bottom leaf spring being provided so as to overlap the top leaf spring by at least 5 mm in the direction of the point of the foot; wherein said artificial foot further comprises an elastic spacer disposed between the leaf springs, the elastic spacer being fabricated from a material possessing a high gliding ability and being essentially T-shaped with a salient portion directed toward the point of the foot which becomes under so as to assume a lingulate configuration so that the leaf springs overlap the spacer on all sides.

4,892,554
PROSTHETIC FOOT

David L. Robinson, 37 Ferrin Pl., Mt. Clemens, Mich. 48043

Filed Dec. 21, 1987, Ser. No. 135,588
Int. Cl.[4] A61F *2/66*
U.S. Cl. 623—55 **9 Claims**



1. A prosthetic foot comprising an ankle member, a heel member underlying said ankle member, first pivot means coupling said heel member to said ankle member for resiliently resisted pivotal movement about a first transverse axis, an

elongate metatarsal-toe member having a rear portion underlying a forward portion of said heel member and projecting forwardly from said heel member, second pivot means coupling said toe member to said heel member for pivotal movement about a second transverse axis, positive stop means engageable between said heel and toe members define an end limit to downward pivotal movement of the forward end of said toe member relative to said heel member, compression means engaged between said heel and toe members for resiliently resisting upward pivotal movement of the forward end of said toe member relative to said heel member, said toe member having an elongate slot therethrough extending longitudinally rearwardly from the forward end of said toe member bifurcating the forward portion of said toe member, the underside of said heel and toe members being conformed to cooperatively define a longitudinally extending concave arch, first means on said heel member defining a weight supporting support point on the underside of said heel member at the rearward end of said arch, second means on said toe member defining first and second weight supporting support points on the underside of said toe member at the forward end of said arch respectively located at opposite sides of said slot, said support points defining a stable three-point support for said foot when in a foot-flat position, and said first and second axes being spaced rearwardly from the center of said arch.

4,892,555

METHOD FOR CONDITIONING FABRICS

Arthur G. Leigh, Wirral, and John Oakes, Cheshire, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 82,023, Aug. 5, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 243,165

Claims priority, application United Kingdom, Aug. 6, 1986, 8619152

Int. Cl.[4] D06L *3/00*

U.S. Cl. 8—101 7 Claims

1. A method of conditioning and bleaching fabrics which comprises tumbling damp fabrics in a laundry dryer with a composition comprising a fabric conditioner which is a cationic material and a compound containing a transition metal ion, selected from groups 4b–7b, 8 and 1b of the Periodic Table, said composition added to the dryer separate from said fabrics, and subsequently washing said fabrics with a bleach containing composition.

4,892,556

PROCESS FOR TRANSFER PRINTING ON LEATHER SUBSTRATES IMPREGNATED WITH AMINOPLAST PRE-CONDENSATE

Herbert W. A. Schulzen, deceased, late of Bad Schwalbach; Elisabeth A. Schulzen, heir; Holger Schulzen, heir, both of Wilhelmstrasse 33, 6208 Bad Schwalbach-Hettenhain, and Petra S. Schulzen, heir, An der Ringkirche 5, 6200 Wiesbaden, all of Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 940,926

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544239

Int. Cl.[4] D06P *3/32, 1/56;* B41M *1/38;* D06M *15/39*

U.S. Cl. 8—436 10 Claims

1. A process for printing on leather substrates using the transfer printing process by surface treatment of the substrate, applying an auxiliary carrier which is printed with sublimable dyes and transferring the dyes onto the substrate by dry heat treatment characterized in that the substrate surface is impregnated with an aqueous solution of a pre-condensate of a urea formaldehyde resin or melamine formaldehyde resin, the solvent is removed at a temperature of up to a maximum of 120° C. which does not cause condensation of the pre-condensate and the dyes are transferred at a temperature of between 140° and 250° C. for a sufficiently long period of time for the pre-condensate to condense out at the same time.

4,892,557

PROCESS FOR FORMING CREPE FABRICS AND FOR TEMPORARILY STABILIZING HIGH TWIST FILAMENT YARN IN THE MANUFACTURE OF SUCH FABRICS

Delano M. Conklin, Burlington, and Joe F. London, Jr., Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 27, 1986, Ser. No. 923,279

Int. Cl.[4] D03D *15/04;* D06C *23/04*

U.S. Cl. 8—497 5 Claims

1. A crepe fabric comprising highly twisted continuous filament yarn woven on a shuttleless loom after having been treated with a hot-melt size, half the yarn having Z-twist and half the yarn having S-twist, said fabric characterized by the appearance, hand and drape of silk and having a selvage consisting of severed weft yarns.

5. A crepe fabric produced by the steps of:

(a) highly twisting a continuous filament yarn followed immediately by;

(b) temporarily reducing the liveliness of the yarn by applying a hot melt size at a temperature of about 290°–300° F. with an add-on of between about 10.5 and 13.5%;

(c) weaving a fabric from said yarn on a shuttleless loom;

(d) restoring the liveliness of the yarn by desizing the woven fabric; and

(e) gradually raising the temperature of the fabric to about 240° F. to develop the crepe of the fabric;

(f) dyeing the fabric; and

(g) framing the fabric.

4,892,558

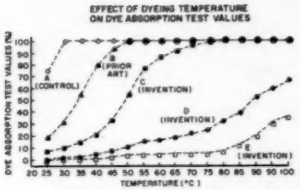
PROCESS FOR DYEING STAIN RESISTANT NYLON CARPETS

Randolph C. Blyth, Gulf Breeze, and Pompeilo A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 296,301, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 84,777, Aug. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 59,714, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 914,507, Oct. 2, 1986, Pat. No. 4,680,212, which is a continuation of Ser. No. 834,804, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 643,606, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 562,370, Dec. 16, 1983, abandoned. This application Jun. 21, 1989, Ser. No. 370,099

Int. Cl.[4] D06P *1/00*

U.S. Cl. 8—560 3 Claims



1. In a process for dyeing carpet containing nylon pile fibers coated with stain blocker, wherein said stain blocker is a polymeric condensation product containing $—SO_3X$ groups where X is hydrogen or a cation and wherein the carpet is treated with an aqueous solution of an acid dye under conditions of time and temperature sufficient to provide dyed carpet of a selected shade, the improvement comprising adding a sufficient amount of said stain blocker to said aqueous solution to provide carpet having a dye absorption value at 25° C. of substantially zero.

4,892,559

ELECTRODE ARTICLE

George B. Park, Nr. Swindon; John A. Cook, Faringdon, and Robert H. McLoughlin, Swindon, all of England, assignors to Scimat Limited, United Kingdom

Division of Ser. No. 667,034, Nov. 1, 1984, abandoned, and a continuation-in-part of Ser. No. 618,111, Jun. 7, 1984, abandoned. This application Aug. 25, 1986, Ser. No. 900,026

Claims priority, application United Kingdom, Nov. 2, 1983, 8329211; Dec. 15, 1983, 8333387

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] H01M *6/00*

U.S. Cl. 29—623.3 17 Claims

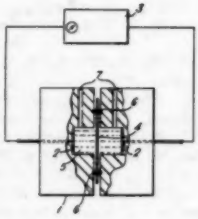
1. A method of making an electrochemical device, comprising:

(a) providing a body of sensitive electrode material;

(b) assembling together said electrode material and a layer of flexible protective material, at least part of which protective material is swellable by electrolyte liquid with which it will come into contact in said device, permitting the electrolyte to permeate through it, which protective material in its non-swollen state protects said electrode material, and which protective material is ready to function as

an electrode separator when said electrode material is used as an electrode in an electrochemical device;

(c) deforming said electrode material so as to decrease its thickness, thereby substantially increasing its surface area, while said electrode material is in contact with said protective material; and



(d) inserting the assembly of said electrode material and said protective material into liquid electrolyte in an electrochemical device to cause the protective material to swell so that its permeability is increased sufficiently to enable it to function as a separator in the device.

4,892,560

FUELS

Nasir M. Sial, c/o Fanar Overseas Limited, Malcolm House, 12 Orange Street, London, England

PCT No. PCT/GB85/00254, § 371 Date Feb. 10, 1987, § 102(e) Date Feb. 10, 1987, PCT Pub. No. WO86/07375, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 10, 1985, Ser. No. 13,829

Int. Cl.[4] C10L *1/00, 1/32*

U.S. Cl. 44—50 **17 Claims**

17. A method of improving the burning properties of molasses which comprises homogenizing a liquid fuel oil with the molasses to form a homogenized mixture consisting essentially of a liquid fuel oil in an amount of between about 15 and 50 percent by weight and molasses present in an amount of between about 85 and 50 percent by weight, wherein the homogenized mixture shows no visual signs of separation for at least one month and has a caloric value of between about 6,470 and 11,025 BTU's per pound.

4,892,561

METHYL ETHER FUELS FOR INTERNAL COMBUSTION ENGINES

Irving E. Levine, 1 Paper Mill Creek Ct., Novato, Calif. 94947

Continuation-in-part of Ser. No. 407,119, Aug. 11, 1982, abandoned. This application Feb. 21, 1986, Ser. No. 832,263

Int. Cl.[4] C10L *1/32, 1/10*

U.S. Cl. 44—51 **7 Claims**

7. The method of operating a Diesel Engine which comprises continuously injecting into the combustion chamber of the engine a fuel consisting essentially of 95 to 99.9% by weight of dimethyl ether and from 0.1 to 5 percent of a cetane number improving additive selected from the group consisting of hydrogen peroxide, ethyl t-butyl peroxide, di-t-butyl peroxide, amyl nitrate and nitromethane.

4,892,562

DIESEL FUEL ADDITIVES AND DIESEL FUELS CONTAINING SOLUBLE PLATINUM GROUP METAL COMPOUNDS AND USE IN DIESEL ENGINES

Wayne E. Bowers, Clearwater, Fla., and Barry N. Sprague, West Haven, Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 796,428, Nov. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,954, Dec. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 790,738, Oct. 24, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 897,864

Int. Cl.[4] C10L *1/30*

U.S. Cl. 44—67 **18 Claims**

1. A method of reducing emissions from or increasing the utilizable energy of diesel fuel for powering internal combustion engines, comprising admixing with diesel fuel a fuel soluble organo-metallic fuel additive composition in an amount effective to supply from 0.01 to 1.0 parts per million of platinum per part of fuel, said composition comprising a compound having the general formula

$$XPtR_1R_2$$

wherein X is a ligand containing at least one unsaturated carbon-to-carbon bond with an olefinic, acetylenic or aromatic pi bond configuration and R_1 and R2 are, independently, benzyl, phenyl, nitrobenzyl or alkyl having from 1–10 carbons.

4,892,563

PHENOLIC-CONTAINING MANNICH BASE REACTION PRODUCTS AND FUEL COMPOSITIONS CONTAINING SAME

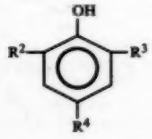
Sheldon Chibnik, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 136,077, Dec. 21, 1987, Pat. No. 4,806,130, which is a division of Ser. No. 813,813, Dec. 27, 1985, Pat. No. 4,717,492. This application Jan. 23, 1989, Ser. No. 299,286

Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—73 **8 Claims**

1. A composition comprising a major amount of a liquid hydrocarbyl fuel normally susceptible to oxidation and a minor antioxidant amount of an additive product prepared by (a) reacting a preformed Mannich base derived from a phenol, a C_1–C_8 alkyl aldehyde and a low boiling amine, and (b) a reactive compound having at least one reactive hydrogen selected from reactive hydrocarbyl amines, said phenol having the following generalized structural formula:



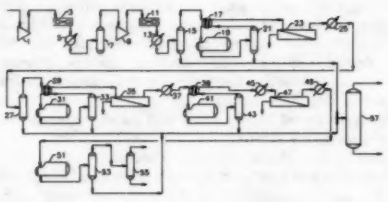
where R^2 and R^3 are the same or different and are hydrogen or C_1 to C_{18} alkyl or tertiary alkyl and R^4 is hydrogen or C_1 to about C_{30} hydrocarbyl, said reaction being carried out with an equivalent amount of Mannich base to amine at temperatures varying from about 25° to about 250° C., said reactive compound having a higher boiling point than said low boiling amine.

4,892,564

MEMBRANE PROCESS FOR HYDROCARBON LIQUID RECOVERY

Thomas E. Cooley, 5215 Spanish Oak, Houston, Tex. 77066

Filed Mar. 24, 1988, Ser. No. 172,670
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **4 Claims**



1. Method of separating components of a feedstock into one or more gas streams comprising mostly hydrogen or methane, and one or more liquid streams comprising mostly C-3 and higher hydrocarbons, comprising:

(a) subjecting the said feedstock to one or more gas-liquid separations producing a gas effluent and a liquid effluent wherein the gas effluent is a feed to a next separation;

(b) subjecting the gas effluent from (a) to one or more gas-gas membrane separations producing a gas residue from the membrane wherein the gas residue from the membrane is cooled producing a gas and liquid mixture and is a feed to a succeeding gas-liquid separation producing a gas effluent and a liquid effluent;

(c) combining a major amount of liquid effluents from the above (a) and (b); and

(d) subjecting the effluents combined in Step (c) to a stripping operation to provide a final liquid product.

4,892,565

ADSORPTIVE SEPARATION UTILIZING MULTIPLE ADSORPTION BEDS

William P. Schmidt; Ravi Kumar, and Alan D. Abel, all of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

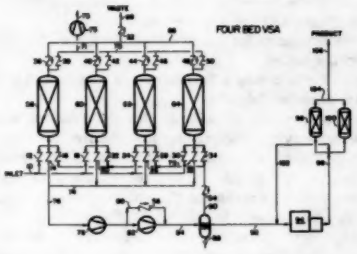
Continuation-in-part of Ser. No. 138,983, Dec. 29, 1987, Pat. No. 4,813,977. This application Dec. 16, 1988, Ser. No. 285,468
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **28 Claims**

1. A process for the production of high purity more selectively adsorbed key component from a gas mixture containing the key component and one or more less selectively adsorbed secondary components using a plurality of parallel adsorption beds which comprises:

(a) drawing said gas mixture through the feed end of a first bed of adsorbent by connecting the effluent end of said bed to the effluent end of a parallel bed, which is presently evacuated, so as to selectively adsorb said key component on said first bed of adsorbent and allow said one or more secondary components to pass through said first bed;

(b) cocurrently rinsing said first bed with high purity key component to remove any co-adsorbed secondary component and void space secondary component from said bed;

(c) countercurrently desorbing said first bed by pressure reduction in one or more stages to a subatmospheric pressure to recover a rinse gas for another of said plurality of beds presently undergoing step (b) and a high purity key component product;



(d) countercurrently repressurizing said first bed by connecting the effluent end of said first bed at its subatmospheric pressure at the end of step (c) with the effluent end of another of said plurality of beds presently undergoing the adsorption of step (a), and

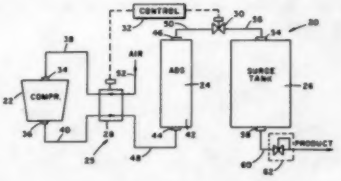
(e) continuing this series of steps with the plurality of beds to form a continuous process for production of high purity key component.

4,892,566

PRESSURE SWING ADSORPTION PROCESS AND SYSTEM

Ravinder K. Bansal, East Amherst, and Edward E. Vrana, West Seneca, both of N.Y., assignors to AirSep Corporation, Buffalo, N.Y.

Filed Mar. 22, 1989, Ser. No. 326,905
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **20 Claims**



1. A pressure swing adsorption process utilizing an adsorber having an inlet and an outlet and a bed of adsorbent material adapted to fractionate at least one constituent from a feed stream of a gaseous mixture routed through the adsorber between the adsorber inlet and the adsorber outlet and reservoir means for receiving product gas exiting the adsorber outlet, said process comprising the steps of;

(a) directing the feed stream into the inlet of the adsorber so that product gas exits the adsorber outlet and accumulates in the reservoir means and so that the internal pressures of the adsorber and the reservoir means are raised to elevated levels;

(b) shutting off the feed stream flow to the adsorber inlet and the product gas flow between the adsorber outlet and reservoir means and venting the adsorber inlet so that the internal pressure of the adsorber falls below that of the reservoir means;

(c) conducting a flow of product gas from the reservoir

means into the adsorber outlet while the feed stream flow to the adsorber inlet remains shut off; and

(d) directing the feed stream into the adsorber inlet to resume feed stream flow thereto and so that the internal pressure of the adsorber equalizes with that of the reservoir means.

13. A pressure swing adsorption system comprising an adsorber having an inlet and an outlet and a bed of adsorbent material adapted to fractionate at least one constituent from a gaseous mixture routed through the adsorber between the adsorber inlet and the adsorber outlet;

reservoir means for receiving product gas exiting the adsorber outlet;

means for directing a feed stream of a gaseous mixture into the adsorber inlet;

first valve means associated with the directing means for selectively conducting the flow of the gaseous mixture into the adsorber inlet or shutting off the flow of the gaseous mixture into the adsorber inlet and for venting the adsorber inlet when the flow of the gaseous mixture into the adsorber inlet is shut off;

second valve means interposed between the adsorber outlet and the reservoir means for selectively conducting or shutting off the flow of product gas between the adsorber outlet and the reservoir means;

control means associated with the first and second valve means so that the system cycles through the sequential stages of;

(a) directing the feed stream into the inlet o the adsorber so that product gas exits the adsorber outlet and accumulates in the reservoir means and so that the internal pressures of the adsorber and the reservoir means are raised to elevated levels;

(b) shutting off the feed stream flow to the adsorber inlet and the product gas flow between the adsorber outlet and reservoir means and venting the adsorber inlet so that the internal pressure of the adsorber falls below that of the reservoir means;

(c) conducting a flow of product gas from the reservoir means into the adsorber outlet while the feed stream flow to the adsorber inlet remains shut off; and

(d) directing the feed stream into the adsorber inlet to resume feed stream flow thereto and so that the internal pressure of the adsorber equalizes with that of the reservoir means.

4,892,567

SIMULTANEOUS REMOVAL OF MERCURY AND WATER FROM FLUIDS

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,194

Int. Cl.[4] B01D *52/04*

U.S. Cl. 55—33 **62 Claims**

1. A method for simultaneously removing mercury and water from a fluid comprising contacting the fluid with an effective amount of a molecular sieve comprising zeolite A containing on its surface 0.001–15% weight of elemental silver or gold and regenerating the molecular sieve for simultaneous water and mercury removal at elevated temperatures.

26. A regenerable molecular sieve capable of simultaneously removing mercury and water from a fluid, comprising zeolite A containing on its surface about 0.001–15% by weight of elemental silver or gold.

4,892,568

PROCESS FOR REMOVING N-TYPE IMPURITIES FROM LIQUID OR GASEOUS SUBSTANCES PRODUCED IN THE GAS-PHASE DEPOSITION OF SILICON

Helene Prigge, Unterschleissheim; Robert Rurländer, Halsbach; Michael Schwab, Neuötting; Hans P. Bortner, and Andreas Englmüller, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jan. 3, 1989, Ser. No. 293,750

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805282

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—73 **10 Claims**

1. A process for removing n-type doping impurities from liquid or gaseous substances produced in the gas-phase deposition of silicon comprising the steps of:

passing the liquid or gaseous substances through a purification station where the liquid or gaseous substances are brought into contact with halides of at least one element selected from the group consisting of silicon, titanium, tin and a combination thereof, whereby adducts are formed containing the impurities;

transferring said halides from said purification station to a regeneration station prior to or at the point when said halides are saturated with said adducts;

regenerating at least part of said halides in said regeneration station by treating said halides at predetermined temperatures to at least partially dissociate said adducts to liberate the impurities; and

transferring said at least part of said halides regenerated to said purification station.

4,892,569

COMPRESSED AIR PRESSURE SUPPLY SYSTEM

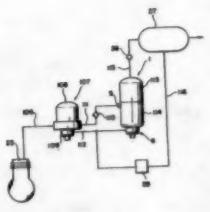
Katsumi Kojima, Yokosuka, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Feb. 22, 1988, Ser. No. 157,726

Claims priority, application Japan, Feb. 23, 1987, 62-024282; Nov. 26, 1987, 62-180287

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—163 **18 Claims**



1. An air compressor system for supplying compressed air, said system comprising:

air compressor means for compressing air;

an air dryer means operatively connected to and disposed downstream of said air compressor means in the system so as to receive compressed air from said air compressor means,

said air dryer means including desiccant for removing moisture from the received compressed air;

an air reservoir operatively connected to and disposed downstream of said air dryer means in the system so as to receive dried compressed air from said air dryer means and for storing the same;

a regenerating valve connected to said air dryer means and communicable therewith and with the atmosphere exterior of the system, said regenerating valve movable be-

tween a first position at which the interior of said air dryer means is open to the atmosphere through said valve and said desiccant is regenerable and a second position at which said regenerating valve closes the interior of said air dryer means to the atmosphere;

an oil separator means connected to and between said air compressor means and said air dryer means, said oil separator means comprising residue removing means for removing residue in compressed air passing from said air compressor means to said air dryer means,

a drain valve connected to said oil separator means and communicable therewith and with the atmosphere, said drain valve movable between a first position at which the interior of said oil separator means is open to the atmosphere and residue removed from compressed air by said oil separator means is dischargeable through said drain valve to the atmosphere and a second position at which said drain valve closes the interior of said oil separator means to the atmosphere;

a non-return valve operatively connected between said oil separator means and said air dryer means for preventing compressed air received by said air dryer means from flowing back to said oil separator means; and

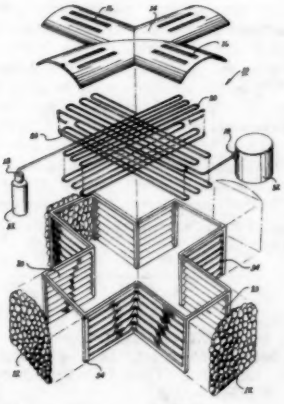
a governor device operatively connected to said regenerating valve and to said drain valve for issuing a command to said regenerating valve when air pressure within said air reservoir reaches a predetermined maximum which causes said regenerating valve to move to the first position thereof thereby opening the interior of said air dryer means to the atmosphere, said governor device ceasing the issuance of said command to said regenerating valve when air pressure within said air reservoir reaches a predetermined minimum, and for issuing a command to said drain valve which causes said drain valve to move to the first position thereof.

4,892,570

WATER PRECIPITATOR APPARATUS

Melvin M. Littrell, 2130 W. Indian School Rd., Apt. 105, Phoenix, Ariz. 85015

Filed Sep. 19, 1988, Ser. No. 245,811
Int. Cl.[4] B01D *53/26*
U.S. Cl. 55—269 **1 Claim**



1. An improved water precipitator apparatus comprising, in combination:

refrigeration means comprised of coils of metal piping connected at one end to a tank filled with Butane and connected at the other end to an empty tank for condensing hot air into water;

structural member means for capturing the hot air irrespective of wind direction and which relies on convection to move the hot air past said refrigeration means; and

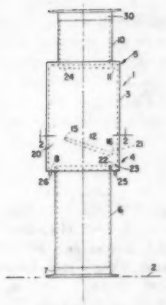
air intake means comprised of a series of air intake flaps that are activated, to the open or closed position, solely by the dynamic pressure of the incoming air for permitting said hot air to enter into said structural member means.

4,892,571

EQUIPMENT AND METHOD TO REMOVE PARTICULATE AND DISSOLVED PARTICLES FROM STEAM

Robert H. Elliott, 6027 Cannon Hill Rd., Fort Washington, Pa. 19034

Filed Aug. 18, 1988, Ser. No. 233,360
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—458 **7 Claims**



1. Equipment to remove soluble and insoluble particles from the output steam of a steam boiler:

an elongated, cylindrically-shaped central member having a straight axis, a steam entrance end, and a steam exit end; an elongated, cylindrically-shaped steam inlet member; means securing said steam inlet member to the steam entrance end of said central member

an elongated, cylindrically-shaped steam outlet member; means securing said steam outlet member to the outlet end of said central member;

a flat, solid baffle member disposed within said central member and having a pair of opposite connector edges, an upper edge and a lower edge respectively extending between the connector edges, the connector edges being connected to the interior wall of the central member and the upper and lower edges being spaced from the interior wall of the central member to respectively form an upper space and a lower space and the baffle member being oriented at an angle to the axis of the central member with said upper edge being disposed closer to said steam exit end than it is to the steam entrance end; and

receiver means connected to said central member adjacent to and below said lower space to receive insoluable particles and water droplets with dissolved particles and convey the same outwardly of the equipment.

4,892,572

OPTICAL FIBER DRAWING APPARATUS

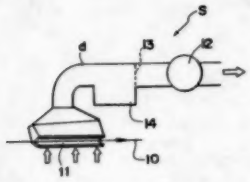
Katsuyuki Tsuneishi; Shigeru Ito, and Takashi Yamazaki, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 22, 1988, Ser. No. 274,855

Claims priority, application Japan, Nov. 24, 1987, 62-177609[U]

Int. Cl.[4] C03B *37/25*

U.S. Cl. 65—10.1 1 Claim



1. An optical fiber drawing apparatus which comprises a heating furnace which fuses a forward end of an optical fiber preform for drawing an optical fiber therefrom, and a screening portion including means for applying tension to the optical fiber through in-line for guaranteeing strength of the fiber, said screening portion further comprising a suction device disposed along a passage of the optical fiber running therethrough for sucking in said optical fiber at a time of breakage of said optical fiber, said suction device comprising a suction port provided along the passage, a suction blower connected to said suction port through a pipe, and a mesh element provided in the pipe between said suction port and said suction blower with a pocket formed in said pipe in a position prior to the mesh element.

4,892,573

PROCESS AND DEVICE FOR MELTING GLASS

Robert Delage, Ribecourt; Marcel Cadier, Velizy-Villacoublay, and Jacques Boillet, Compiegne, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Oct. 13, 1987, Ser. No. 106,863

Claims priority, application France, Oct. 13, 1986, 86 14172

Int. Cl.[4] C03B *5/187*

U.S. Cl. 65—179 13 Claims

1. A device for melting glass before pouring onto a float bath, comprising a melting furnace for the tank having means defining zones which are a melting zone, a refining zone, and a homogenization zone separated from the refining zone by an intermediate zone, and means for agitation of the molten glass in the tank, wherein the means for agitation are located in the intermediate zone and are comprised of (1) at least one horizontally extending agitator formed of a series of essentially vertically downward extending loops and horizontally extending means horizontally connecting said loops, with said loops extending over essentially the entire width of the tank, and are further comprised of (2) means imparting to each point of the agitator an elliptical motion in a horizontal plane the imparting means being capable of varying the axes of the ellipse traversed by said each point of the agitator.

4,892,574

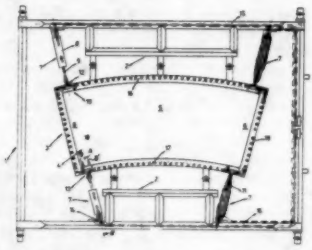
APPARATUS FOR THE HORIZONTAL BENDING AND TEMPERING OF GLASS SHEETS

Sergio V. Cortes, Sector Monterrey, Mexico, assignor to Vitro Flex, S.A., Mexico

Filed Jul. 11, 1988, Ser. No. 217,667

Int. Cl.[4] C03B *23/025*

U.S. Cl. 65—273 6 Claims



1. In an apparatus for bending glass sheets comprising a lehr, a horizontal conveyor for transporting glass sheets through said lehr, a ceramic holder mold to pick up the glass sheets from said conveyor by means of a vacuum which forces the glass sheet to adhere to said holder, a ring mold mounted on a shuttle to move directly below the holder, means for cutting said vacuum and release the glass sheet onto said ring mold for gravity forming of said sheet, and means for moving said shuttle to transport the glass sheet from the lehr to a quench and tempering zone, the improvement which comprises a plurality of press forming dies arranged by pairs at the side edges of the ring mold, with each die of each pair located on the end of a zone wherein a sharp curvature is desired, each of said press forming dies comprising a non-rotatable radius piece having a radius of curvature corresponding to the radius of curvature desired for said zone of the glass sheet and having a length sufficient to press over a large proportion of the width of said zone so as to produce a uniform sharp bending of the glass sheet, and means to move said dies sidewardly of the ring mold from a fully retracted position outwardly of the side edges of said ring mold to a fully extended or press forming position inwardly of the side edges of said ring mold and over the side edges of the glass sheet, whereby to more sharply bend said glass sheet in the desired zones by pressure non-rotatable contact of said dies on the periphery of said glass sheet against said ring mold.

4,892,575

HERBICIDAL SULFONAMIDES

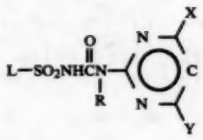
Martha M. Bolinski, Northeast, Md., and Donald J. Dumas, Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 60,567, Jun. 11, 1987, Pat. No. 4,744,816, which is a continuation of Ser. No. 731,261, May 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 618,412, Jun. 7, 1984, abandoned. This application Feb. 19, 1988, Ser. No. 160,296

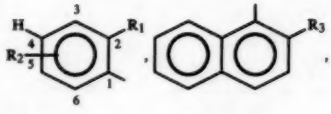
Int. Cl.[4] A01N *43/54*; C07D *251/52, 401/12, 409/12*

U.S. Cl. 71—90 15 Claims

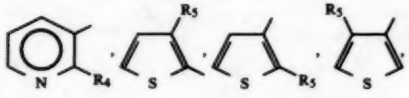
1. A compound of the formula:



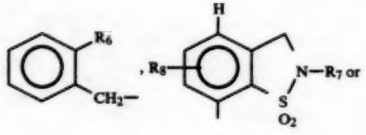
wherein
R is H or CH_3;
L is



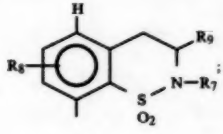
L-1 L-2



L-3 L-4 L-5 L-6

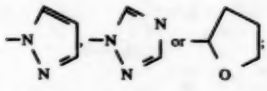


L-7 L-8



L-9

R_1 is C_1–C_4 alkyl, C_1–C_4 alkoxy, F, Cl, Br, NO_2, CO_2R_{10}, $SO_2NR_{11}R_{12}$, $SO_2N(OCH_3)CH_3$, $S(O)_nR_{13}$, CH_2OCH_3, $CH_2OC_2H_5$, C_6H_5 or Q;
Q is



Q-1 Q-2 Q-3

R_2 is H, F, Cl, Br, CF_3, CH_3, C_2H_5, OCH_3, OC_2H_5, SCH_3 or SC_2H_5;
R_3 is H, CH_3, OCH_3, F, Cl, Br, $SO_2N(CH_3)_2$, OSO_2CH_3 or $S(O)_nCH_3$;
R_4 is CH_3, C_2H_5, OCH_3, OC_2H_5, F, Cl, Br, $SO_2NR_{11}R_{12}$, $SO_2N(OCH_3)CH_2$ or $S(O)_nR_{13}$;
R_5 is C_1–C_3 alkyl, F, Cl, Br, NO_2, CO_2R_{10}, $SO_2NR_{11}R_{12}$, $SO_2N(OCH_3)CH_3$ or $S(O)_nR_{13}$;
R_6 is CO_2CH_3, $CO_2C_2H_5$, $SO_2N(CH_3)_2$, OSO_2CH_3, SO_2CH_3 or $SO_2CH_2CH_3$;
R_7 is H, C_1–C_5 alkyl, CH_2CH_2F, $CH_2CH_2CH_2F$, C_3–C_4 alkenyl, C_3–C_4 alkynyl, $CH_3OCH_2CH_2$ or $C_2H_5OCH_2CH_2$;
R_8 is H, Cl, CH_3 or OCH_3;
R_9 is H or CH_3;
R_{10} is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl, $CH_2CH{=}CH_2$ or $CH_2C{\equiv}CH$;
R_{11} is H or C_1–C_2 alkyl;
R_{12} is C_1–C_2 alkyl;
R_{13} is C_1–C_3 alkyl;
n is 0, 1 or 2;
X is $NR_{14}R_{15}$;
R_{14} is H or C_1–C_2 alkyl;
R_{15} is C_1–C_2 alkyl, OCH_3, OC_2H_5 or CH_2CN;
Y is OCH_2CH_2F, OCH_2CHF_2 or OCH_2CF_3; and
Z is CH;
and their agriculturally suitable salts.

11. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

4,892,576

6,7-DIHYDRO-PYRAZOLO (1,5-A)(1,3,5)TRIAZINE-2-SULPHONAMIDES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Martin Krüger; Jürgen Westermann; Friedrich Arndt; Richard Rees, all of Berlin, Fed. Rep. of Germany, and Russel G. Hunt, Harston, England, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

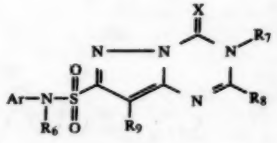
Filed Jun. 30, 1988, Ser. No. 213,905

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3722072

Int. Cl.[4] A01N *43/14, 43/66, 43/68*; **C07D** *251/00*

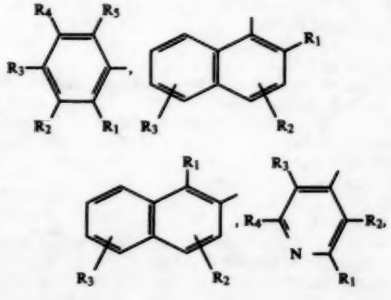
U.S. Cl. 71—93 **16 Claims**

1. 6,7-Dihydropyrazole[1,5-a][1,3,5]triazine-2-sulphonamides of formula I



(I)

in which
Ar is phenyl, naphthyl, pyridyl or thienyl group of general formula



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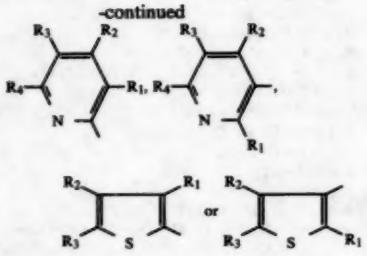


R_1, R_2, R_3, R_4 and R_5 are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy, halo-C_1–C_4-alkyl, C_1–C_4-alkoxy, halo-C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl, halogen, C_1–C_4-alkoxy, a group R_{10}—O—CO, a carbamoyl group $R_{11}R_{12}N$—CO—, an amino group $R_{11}R_{12}N$—, cyano, nitro, a sulphur containing group R_{10}—$S(O)_n$—, an acyl group R_{10}—CO, a group R_{10}—O—CO—$(CH_2)_n$, or phenyl or phenoxy, both of which are optionally substituted by one of more of C_1–C_4-alkyl, halo or nitro,

R_6 is hydrogen, an acyl group R_{10}—CO, a group R_{10}—O—CO—, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, phenyl-C_1–C_4-alkyl, a carbamoyl group $R_{11}R_{12}N$—CO—, an alkali metal, an alkaline earth metal or ammonium group, optionally substituted by C_1–C_6-alkyl,

R_7 and R_8 are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by halo or C_1–C_4-alkoxy, a phenyl-C_1–C_6-alkyl, phenyl-C_2–C_6-alkenyl or phenyl-C_2–C_6-alkynyl group, each of which is optionally substituted by halo, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkyl or halo-C_1–C_4-alkyl, phenyl, substituted by R_1, R_2, R_3, R_4 and R_5, an acyl group R_{10}—CO, a group R_{10}—O—CO, a group R_{10}—O—CO—$(CH_2)_n$, a carbamoyl group $R_{11}R_{12}N$—CO—, or a sulphonyl group R_{10}—SO_2,

R_9 is hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by halo or C_1–C_4-alkoxy, a phenyl-C_1–C_6-alkyl, phenyl-C_2–C_6-alkenyl or phenyl-C_2–C_6-alkynyl group, each of which is optionally substituted by halo, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkyl or halo-C_1–C_4-alkyl, phenyl, substituted by R_1, R_2, R_3, R_4 and R_5, an acyl group R_{10}—CO, a group R_{10}—O—CO, a group R_{10}—O—CO—$(CH_2)_n$, a carbamoyl group $R_{11}R_{12}N$—CO—, a sulphonyl group R_{10}—SO_2 or R_{10}—O—SO_2, cyano or nitro

R_{10} is hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or phenyl-C_1–C_4-alkyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy or C_1–C_4-alkoxy, or phenyl, optionally substituted by halo, nitro or C_1–C_4-alkyl,

R_{11} and R_{12} are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy or C_1–C_4-alkoxy, or

R_{11} and R_{12} together with the adjacent nitrogen form a pyrrolidinyl, piperidino or morpholino ring,

X is oxygen or sulphur, and

n is 0, 1 or 2.

3. A herbicidal and plant-growth regulant composition with comprises an effective herbicidal and plant growth regulant amount of a compound according to claim 1, in admixture with carriers and diluents.

4,892,577

SOLUTION OF 3-ALKYLTHIO-4-AMINO-6-TERT.-BUTYL-1,2,4-TRIAZIN-5-ONES IN NORMALLY LIQUID N-ARYL-N-ALKOXYALKYL-HALOACETAMIDES

Joseph Synek, Overland Park, Kans., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1985, Ser. No. 801,885

Int. Cl.[4] A71N 43/4

U.S. Cl. 71—93 **17 Claims**

1. A solution of a 3-alkylthio-4-amino-6-tert.-butyl-1,2,4-triazin-5-one in at least twice its weight of a normally liquid N-aryl-N-alkoxyalkyl-haloacetamide.

4,892,578

PHENYLMETHYL-4,4-DIMETHYL-3-ISOXAZOLIDINONE PLANT REGULATORS

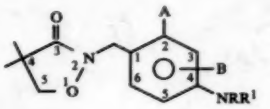
Jun H. Chang, Princeton Junction, and Jonathan S. Baum, Pennington, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 6, 1987, Ser. No. 118,390

Int. Cl.[4] A01N 43/80, 43/42; C07D 261/04, 413/12

U.S. Cl. 71—94 **3 Claims**

1. A plant regulating 2-[(4-substituted phenyl)-methyl]-4,4-dimethyl-3-isoxazolidinone of the formula



or an agriculturally acceptable salt thereof in which

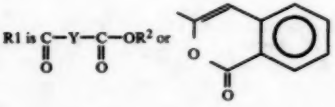
(A)

A is hydrogen or halogen,

B is hydrogen or halogen,

or A and B together form —C_4H_4— bridging adjacent carbon atoms;

R is hydrogen or lower alkyl;



R^2 is hydrogen, methyl diphenylmethyl or an agriculturally acceptable cation, and Y is

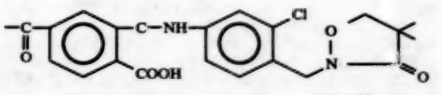
(a) lower alkylene or lower alkenylene which may be substituted with halogen or phenyl,

(b) ortho-cyclohexylene or ortho-cyclohexenylene which may be substituted with methyl,

(c) ortho-bicycloalkylene of 7 or 8 carbon atoms,

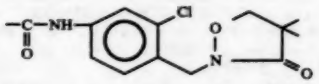
(d) ortho-oxabicycloalkenylene of 6 or 7 carbon atoms,

(e) ortho-phenylene which may be substituted with lower alkyl, halogen, nitro, a group of formula I



I

or with carboxyl and a group of formula II

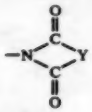


II

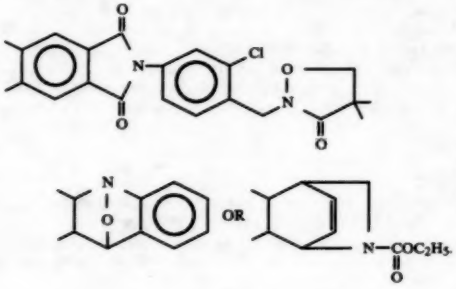
(f) ortho-naphthalene,

(g) ortho-phenylmethylene,

(B) A and B are as defined above and NRR[1] is (2-hydroxyphenyl)methylimino, (4-halo-2-hydroxyphenyl)-methylimino, (thien-2-yl)methylimino, phthalidylidenylamino, or a group of the formula



in which Y is as defined above



4,892,579

PROCESS FOR PREPARING AN AMORPHOUS ALLOY BODY FROM MIXED CRYSTALLINE ELEMENTAL METAL POWDERS

Lowell E. Hazelton, Sunol, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 184,533, Apr. 21, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 285,677

Int. Cl.[4] B22F 9/00

U.S. Cl. 75—0.5 B 30 Claims

1. A process for preparing mixed elemental metal powders comprising the steps of:

(1) entraining vapors of at least a first metal and a second metal, the two metals being selected such that they have a negative heat of mixing when combined, in separate heated inert gas streams;

(2) cooling each inert gas stream adiabatically by passing it through a nozzle, to produce an elemental metal powder aerosol;

(3) mixing the inert gas streams to produce mixed elemental metal powder aerosols;

(4) collecting the mixed elemental metal powder aerosols to form mixed elemental metal powders.

4,892,580

LEAD-CONTAINING ADDITIVE FOR STEEL MELTS

Bernd Neuer, Schnaitsee, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,535

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739154

Int. Cl.[4] C21C 7/02

U.S. Cl. 75—53 16 Claims

1. A lead containing additive (for steel melts,) which comprises a cored wire consisting of a metallic sheath and finely-divided filling material, the finely-divided filling material consisting of

(a) metallic lead or a lead alloy, and

(b) a lime-containing material which splits off carbon dioxide at the temperature of the steel melt.

4,892,581

DISPERSION STRENGTHENED COPPER

Haskell Sheinberg, Los Alamos, N. Mex.; Thomas T. Meek, Knoxville, Tenn., and Rodger D. Blake, Santa Fe, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 281,158, Dec. 5, 1988, Pat. No. 4,857,266. This application Apr. 4, 1989, Ser. No. 333,073

Int. Cl.[4] C22C 29/12

U.S. Cl. 75—232 3 Claims

1. A composition of matter in the form of a consolidated shape consisting essentially of copper and particles which are dispersed throughout the copper where the particles are comprised of copper oxide or copper having a coating of copper oxide.

4,892,582

DENTAL FILLING-MATERIAL AND METHOD FOR ITS PREPARATION

Walter Diehl, Hanau, and Hans-Martin Ringelstein, Frankfurt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 301,048

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1988, 3804022

Int. Cl.[4] C22C 3/00, 5/02

U.S. Cl. 75—251 5 Claims

1. A dental-filling material comprising a gold-alloy powder for filling dental cavities by gold condensation, said gold-alloy powder being formed of gold and at least one metal capable of alloying with gold to produce a hard gold alloy and which metal is soluble in nitric acid, the surface layer of said gold-alloy powder being rough and consisting of pure gold.

4,892,583

1-METHYL-3,5,7-TRIAZA-1-AZONIATRICYCLODECANE TRIIODIDE, A METHOD OF PREPARATION, AND ITS USE IN THE CONTROL OF MICROORGANISMS IN AQUEOUS SYSTEMS

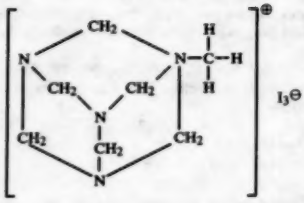
S. Rao Rayudu, Germantown, Tenn., assignor to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Nov. 4, 1988, Ser. No. 268,205

Int. Cl.[4] C09D 5/16; C07D 487/12

U.S. Cl. 106—18.32 3 Claims

1. A method of preserving an aqueous system which is susceptible to microbiological degradation, comprising the step of adding to said system a compound having the formula



wherein said compound is added in an amount sufficient to inhibit the growth and proliferation of at least one microorganism in said aqueous system.

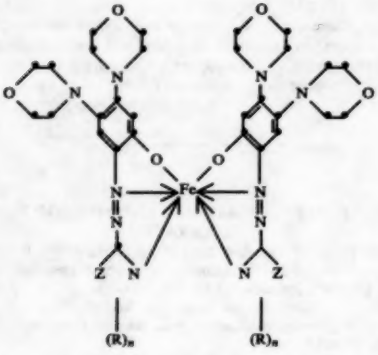
4,892,584

WATER SOLUBLE INFRARED ABSORBING DYES AND INK-JET INKS CONTAINING THEM

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,752
Int. Cl.[4] C09D *11/02*; C09B *45/32*
U.S. Cl. 106—22 10 Claims

1. A water-soluble, ferrous-chelate, infrared absorptive dye having the structure:



wherein

n is 1 to 3;

Z represents the atoms to complete a nitrogen containing, aromatic heterocyclic group, and

R represents at least one water solubilizing group.

4,892,585

PROCESS FOR PRODUCING ARTICLES MADE FROM POLYURETHANE FOAM AND ADDITIVE FOR PERFORMING THIS PROCESS

Wolfgang Fischer, Morlenbach; Thomas Hattich; William Krug, both of Heidelberg, and Gerhard Schuster, Nuremberg, all of Fed. Rep. of Germany, assignors to Grace Service Chemicals GmbH, Heidelberg, Fed. Rep. of Germany

Division of Ser. No. 927,896, Nov. 6, 1986, Pat. No. 4,783,296. This application Oct. 17, 1988, Ser. No. 248,698
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541513
Int. Cl.[4] B28B *7/36*
U.S. Cl. 106—38.22 14 Claims

1. A release agent composition comprising an aqueous carrier fluid, a mould release agent, an alkali metal or ammonium salt of a C_{18}–C_{30}-fatty acid and a C_4–C_{26}-alcohol.

4,892,596

CONCRETE COMPOSITION FOR ROLLER COMPACTED PLACING METHOD

Yoshiharu Watanabe; Hisayuki Shimizu, and Mineo Ito, all of Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 22,588, Mar. 3, 1987, which is a continuation of Ser. No. 809,991, Dec. 17, 1985, abandoned. This application Jun. 3, 1988, Ser. No. 205,027
Claims priority, application Japan, Dec. 26, 1984, 59-276698
Int. Cl.[4] C04B *24/00, 24/10*
U.S. Cl. 106—92 16 Claims

1. A concrete composition for a roller compacted placing method, comprising 100 parts by weight of a cement, an aggregate, from 0.05 to not more than 0.5 parts by weight of an organic acid and/or a salt thereof, from 0.05 to not more than 2 parts by weight of a set accelerating inorganic salt and from 2 to not more than 15 parts by weight of a calcium sulfate when calculated in terms of $CaSO_4$, said cement being selected from the group consisting of Portland cements, mixed cements and mixtures thereof, said mixed cements being selected from the group consisting of silica cement, fly ash cement and blast furnace cement, said organic acid and/or a salt thereof being selected from the group consisting of hydroxypolycarboxylic acids, hydroxymonocarboxylic acids, saturated and unsaturated carboxylic acids, polymers of carboxylic acids, salts of said acids and mixtures thereof, said set accelerating inorganic salt being selected from the group consisting of carbonates, silicates, aluminates and hydroxides of alkali metals and mixtures thereof, wherein said concrete composition has a slump of not more than 3 cm.

4,892,587

LIGNOSULFONATE ADDITIVE-CONTAINING CARBON BLACK COMPOSITIONS

Peter Dilling, Isle of Palms; Gerald Prazak, Charleston, and Catherine C. Cashman, Hanahan, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,156
Int. Cl.[4] C08L *97/02*
U.S. Cl. 106—123.1 4 Claims

1. A carbon black composition comprising carbon black and a sulfonated lignin dispersant prepared by methylolating a lignin material by reaction less than about 2 moles formaldehyde per 1,000 grams of the lignin and sulfonating the methylolated lignin by reaction with from about 2.3 to about 3.5 moles of a sulfite or bisulfite compound per 1,000 grams of the lignin at an initial reaction pH of below about 6.6 and at a temperature of about 170° C., allowing the reaction pH to rise to a final pH greater than 7.5 to sequentially sulfonate both the methylolated aromatic nucleus and a side chain of the lignin.

4,892,588

PRODUCTION OF LIGNOSULFONATE ADDITIVES

Peter Dilling, Isle of Palms; Vaughn R. Loeffler, Summerville; Gerald Prazak, Charleston, and Karin U. Thomas, Alvin, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,155
Int. Cl.[4] C08L *97/02*
U.S. Cl. 106—123.1 5 Claims

1. A method of producing a lignin dispersant composition comprising the steps of methylolating a lignin compound by reaction with less than about 2 moles formaldehyde per 1,000 grams of the lignin, and sulfonating the methylolated lignin by reaction with from about 2.5 to 3.5 moles of a sulfite or bisulfite compound per 1,000 grams of lignin at an initial reaction pH of below about 6.6 and at a temperature of at least about 170° C., while allowing the pH of the reaction mixture to rise to a final pH of greater than 7.5 to sequentially sulfonate both the methylolated aromatic nucleus and the side chain of the lignin.

4,892,589

COMPOSITION COMPRISING WATER-SOLUBLE, NONIONIC HYDROPHOBICALLY MODIFIED HYDROXYETHYL CELLULOSE AND WATER-SOLUBLE, NONIONIC HYDROXYETHYL CELLULOSE

William J. Kirkland, Newark, Del.; Carl A. Lukach, Katy, Tex., and William C. McLachlan, West Chester, Pa., assignors to Aqualon Company, Wilmington, Del.

Division of Ser. No. 115,214, Oct. 30, 1987, Pat. No. 4,784,693. This application Aug. 16, 1988, Ser. No. 232,820
Int. Cl.[4] C04B *24/10*
U.S. Cl. 106—197.1 20 Claims

1. A composition of matter comprising, (a) from about 1 to about 99% water-soluble, monionic hydroxyethyl cellulose and (b) from about 99 to about 1% water-soluble, nonionic hydrophobically modified bydroxyethyl cellulose, based on the total dry weight of (a) the water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose and (b) the water-soluble, nonionic hydroxyethyl cellulose, wherein the hydrophobic modifier of the water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose is a long chain alkyl group attached to the cellulose in an amount of from about 0.2 to about 4%, by weight of the fully substituted water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose.

4,892,590

PRECIPITATED CALCIUM CARBONATE-CATIONIC STARCH BINDER AS RETENTION AID SYSTEM FOR PAPERMAKING

Robert A. Gill, Bethlehem, Pa., and Nigel D. Sanders, Somerville, N.J., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,175
Int. Cl.[4] C08L *91/00*; D21D *3/00*
U.S. Cl. 106—214 4 Claims

1. A binder system for use in a papermaking process, said system comprising a highly dispersible, high surface area precipitated calcium carbonate and a cationic starch. Wherein the precipitated calcium carbonate has a surface area of from 10 m^2/g-200 m^2/g and the ratio of precipitated calcium carbonate: cationic starch is 2:1 to 1:20 by weight.

4,892,591

FILLER FOR INK JET RECORDING PAPER

Masahide Ogawa; Teiji Sato, both of Shibata; Masao Takahashi, Shiunji, and Kazumitsu Enomoto, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,804
Claims priority, application Japan, Jun. 6, 1987, 140767
Int. Cl.[4] C04B *14/04*
U.S. Cl. 106—482 10 Claims

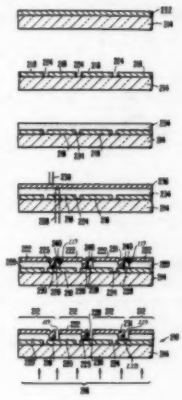
1. A filler for ink jet recording paper, said filler being composed of amorphous silica particles having a median diameter, measured by the coulter counter method, of 2 to 15 μm, an oil absorption of at least 180 ml/100 g, a refractive index, measured by the solvent method, of 1.460 to 1.500, and a moisture absorption, measured when it is caused to absorb moisture for 200 hours at a relative humidity of 90% and a temperature of 25° C., of at least 35%, and a coating of a compound of a metal of Group II of the periodic table on the surface of the silica particles in an amount of 0.5 to 20% by weight, wherein the coated silica particles has an acid amount, in an acid strength function H_o of more than +1.5 and up to +3.3, of not more than 0.020 millimole/g.

4,892,592

THIN FILM SEMICONDUCTOR SOLAR CELL ARRAY AND METHOD OF MAKING

Charles R. Dickson, Trenton; Barry J. Johnson, Cream Ridge, both of N.J., and David B. Gerhardt, Solebury, Pa., assignors to Solarex Corporation, Rockville, Md.

Continuation of Ser. No. 31,919, Mar. 26, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 270,443
Int. Cl.[4] H01L *27/14, 31/18*
U.S. Cl. 136—244 10 Claims



10. A multi-cell thin-film semiconductor device fabricated by a process comprising the steps of:

a. fabricating a plurality of spaced-apart front electrodes on a substrate;

b. fabricating a thin film of semiconductor material on said front electrodes;

c. fabricating a thin film of metal on said semiconductor film;

d. scribing said metal film along a pattern of first lines with a laser operated at a first power density sufficient to melt said metal through said underlying semiconductor film and form electrical connections between said metal film and said front electrodes along said first lines; and

e. scribing said semiconductor film along a pattern of second lines with a laser operated at a second power density sufficient to ablate said semiconductor material along said second lines, said second lines being substantially parallel to and adjacent said first lines, the ablation of said semiconductor material producing gases that structurally weaken and burst through said metal film overlying said semiconductor material along said second lines to form gaps separating said metal film into a plurality of back electrodes.

4,892,593

SOLAR TRAP

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 659,227, Oct. 9, 1984, Pat. No. 4,723,535. This application Jan. 7, 1988, Ser. No. 141,910
Int. Cl.[4] H02N *6/00*; F24J *2/18*
U.S. Cl. 136—246 10 Claims

1. A solar energy collecting apparatus comprising in combination:

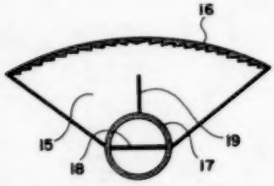
(a) a light funneling trough including two flat light reflecting surfaces disposed in a face-to-face arrangement having an oblique angle therebetween;

(b) a two dimensional Fresnel lens covering the opening of the light funneling trough at the diverging extremity thereof;

(c) a photovoltaic panel facing the two dimensional Fresnel

lens disposed adjacent to the converging extremity of the light funneling trough; and

(d) at least one dual-sided light reflecting planar member disposed radially intermediate the two light reflecting surfaces, said dual-sided light reflecting planar member extending from the converging extremity of the light funneling trough towards the diverging extremity thereof



and terminated at a substantial distance away from the plane including the opening of the light funneling trough; wherein the sunlight entering the light funneling trough through the two-dimensional Fresnel lens is refracted by the two dimensional Fresnel lens and funneled by the light funneling trough towards the converging extremity of the light funneling trough and irradiates the photovoltaic panel.

4,892,594

PHOTOVOLTAIC ELEMENT

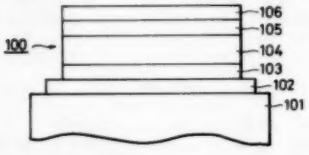
Ryoji Fujiwara, Kamakura; Minori Yamaguchi, Akashi, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Kanegafuchi Chemical Industry Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 106,924, Oct. 7, 1987, abandoned, which is a continuation of Ser. No. 871,167, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 703,486, Feb. 20, 1985, abandoned. This application Oct. 5, 1988, Ser. No. 253,890

Claims priority, application Japan, Feb. 23, 1984, 59-33003

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—258 **7 Claims**



1. A photovoltaic element having a p-i-n laminated structure on a substrate, comprising in sequence:

a first electroconductive layer;

a transparent iridium oxide layer having a thickness of 20 to 5000 Å and p-type conductivity;

a hydrogenated amorphous silicon active layer having a thickness of 1000-20,000 Å and i-type conductivity;

a hydrogenated amorphous silicon layer having a thickness of 50 to 2000 Å and n-type conductivity; and

a second electrocondouctive layer.

4,892,595

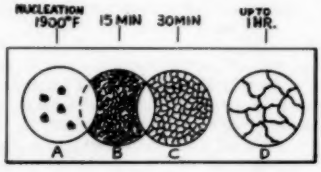
METHOD OF FORMING HIGH QUALITY MOLD PIN INSERT

Orie E. Holmes, 18997 Barroso St., Rowland Heights, Calif. 91748

Filed Apr. 30, 1986, Ser. No. 858,213

Int. Cl.[4] C21D *8/00*

U.S. Cl. 148—12 R **13 Claims**



7. In the method of forming a mold pin for a high quality mold, the steps comprising:

selecting a steel rod formed by a rolling process which drives any impurities in the rod toward its center, whereby the rod has a longitudinally extending central region having a relatively high concentration of such impurities and an annular region surrounding said central region having a relatively low concentration of said impurities,

longitudinally coring a cylindrical slug from said annular region,

heating said slug in a corrosion inhibiting atmosphere to a point of dendritic crystal formation in the steel of the slug between nucleation and the onset of dendritic crystal growth and thereafter quenching and thermally drawing the slug to the desired hardness, and

machining and polishing the slug to the desired outside diameter.

4,892,596

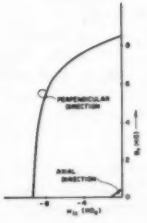
METHOD OF MAKING FULLY DENSE ANISOTROPIC HIGH ENERGY MAGNETS

Dilip K. Chatterjee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 23, 1988, Ser. No. 159,635

Int. Cl.[4] H01F *1/02*

U.S. Cl. 148—104 **6 Claims**



1. A method of making anisotropic permanent magnets which comprises extruding a rare earth, transition metal, magnetic alloy together with an oxygen-getter material at a temperature of from about 600° C. to about 1000° C. at an extrusion ratio of from about 10:1 to about 26:1 said rare earth, transition metal, magnetic alloy and said oxygen-getter material being disposed within an extrusion zone in separate and discrete locations.

4,892,597

DISSOLVED TRINITROTOLUENE IN SENSITIZED NITROMETHANE

John D. Sullivan, Jr., Edgewood, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 30, 1989, Ser. No. 401,194
Int. Cl.[4] C06B 25/38
U.S. Cl. 149—91 10 Claims

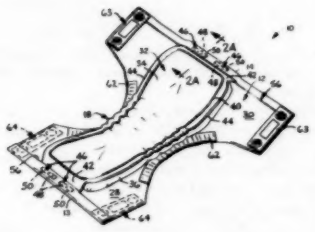
1. An explosive composition comprising an effective explosive amount of the combination of (a) nitromethane, (b) trinitrotoluene, and (c) pyridine.

4,892,598

METHOD OF INTEGRATING AN ABSORBENT INSERT INTO AN ELASTOMERIC OUTER COVER OF A DIAPER GARMENT

Robert A. Stevens, Appleton; Leona G. Boland, Neenah, and John L. Chiatalas, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 30, 1987, Ser. No. 140,264
Int. Cl.[4] B32B 31/04
U.S. Cl. 156—91 28 Claims



1. A method of integrating a fluid-absorbing component into a holding component of an anatomically form-fitting and generally self-adjusting diaper garment, said method comprising the steps of:

a. providing a flexible, resiliently stretchable positioning means for holding and positioning the absorbing component during use, delimiting a shape having front and rear waist sections, an intermediate crotch section, a pair of leg openings along opposed marginal edges of said crotch section and front and rear panels separated from one another by said crotch section;

b. providing a relatively inelastic insert means containing said fluid-absorbing component for absorbing and containing bodily fluids and other wastes, delimiting a shape, superposable on an inner, body-facing surface of said positioning means, with opposed longitudinal ends and a pair of sides extending between and interconnecting said ends;

c. providing cooperable retaining means on said insert means and said positioning means, respectively, for retaining said insert means, including fastening means and slot-forming means adapted for receiving said fastening means therethrough while allowing substantially unrestricted functional elongation and retraction of said positioning means relative to said insert means;

d. providing a flexible shape-retaining means disposed with said inelastic insert means for maintaining said inelastic insert means in a generally body-conforming orientation;

e. superposing said insert means on said inner surface of said positioning means; and

f. fastening said fastening means together through said slot-forming means, integrating said insert means with said outer cover means and forming said diaper garment.

4,892,599

JOINING METAL COMPONENTS

William F. Marwick, Daventry, England, assignor to Alcan International Limited, Montreal, Canada

Filed Sep. 29, 1988, Ser. No. 250,909
Claims priority, application United Kingdom, Oct. 7, 1987, 8723565
Int. Cl.[4] B32B 35/00
U.S. Cl. 156—94 6 Claims

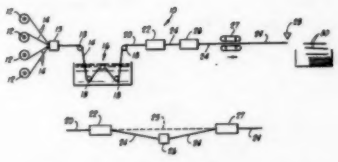
1. A method of joining components of a metal structure, which method comprises applying a heat-curable adhesive between faying surfaces of the components, applying an infra-red absorbing coating to an exterior surface of the structure in the vicinity of the adhesive, and curing the adhesive by applying infra-red radiation to the coated surface.

4,892,600

METHOD AND APPARATUS FOR PULTRUDING NON-LINEAR THERMOPLASTIC COMPOSITE ARTICLES

William H. Beever, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1988, Ser. No. 284,673
Int. Cl.[4] B32B 27/02, 31/12; B31F 1/00
U.S. Cl. 156—166 13 Claims



1. A method of continuously pultruding non-linear reinforced thermoplastic composite articles comprising:

pulling a reinforcing material impregnated with a thermoplastic material through a heated composite forming die, the temperature of said die being such that said thermoplastic material is initially melted and upon exiting said die the resulting formed thermoplastic composite is still deformable;

moving said deformable composite transversely to the direction in which said composite passes through said heated die while cooling said composite to produce one or more angular bends therein,

wherein said deformable composite is pulled through a cooling guide after exiting said heated die, and said cooling guide is moved transversely to the direction in which said composite passes through said heated die to thereby transversely move said composite, said moving occurring while the composite is advancing through said cooling guide; and dividing said cooled composite into separate nonlinear articles.

4,892,601

POLE REPAIR SYSTEM

Leslie S. Norwood, Northants, England, assignor to Scott Bader Company Limited, Northamptonshire, United Kingdom

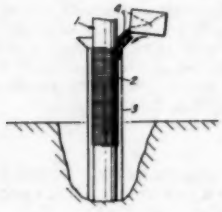
Filed Aug. 8, 1988, Ser. No. 229,505
Claims priority, application United Kingdom, Aug. 13, 1987, 8719143
Int. Cl.[4] B32B 35/00
U.S. Cl. 156—94 16 Claims

1. A method selected from repairing, protecting and strengthening a utility pole (1) projecting from the ground, which method comprises

fitting a compressible elastomeric interlayer around the pole so that the interlayer is at least mechanically bonded to the pole,

fitting a sleeve around the pole so as to provide a clearance between the sleeve and the interlayer surrounding the pole,

introducing into the clearance between the sleeve and the interlayer a flowable hardenable composition, which said composition is essentially free from shrink on said hardening, and



allowing the composition to harden so as to form a core, which core is at least mechanically bonded both to the interlayer and to the sleeve, and thereby

forming an assembly in which each of the pole, the interlayer, the core and the sleeve provides a respective structural component of the assembly.

4,892,602

HEAT-SENSITIVE TRANSFER MEDIUM

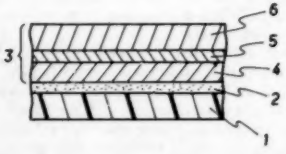
Hitoshi Oike, and Motoshige Yanagimachi, both of Kyoto, Japan, assignors to Oike Industrial Co., Ltd., Kyoto, Japan

Filed Aug. 14, 1987, Ser. No. 85,190

Claims priority, application Japan, Aug. 19, 1986, 61-195013; Sep. 4, 1986, 61-208722; Feb. 16, 1987, 62-32984

Int. Cl.[4] B41M *5/26*

U.S. Cl. 156—233 **13 Claims**



1. A method for producing print images having a metallic luster by use of a heat-sensitive transfer medium, which comprises the steps of:

(a) preparing a heat-sensitive transfer medium comprising a support and a transfer layer on one side of said support wherein said transfer layer comprises a protective resin layer having a heat deformation temperature of at least 120° C., a metal deposition layer on said resin layer, and an adhesive layer over said metal deposition layer;

(b) bringing said adhesive layer of said transfer layer into contact with a receiving medium; and

(c) heating localized areas of said transfer layer by means of a thermal head which is brought into contact with the support of the transfer medium, thereby selectively transferring the heated areas of the transfer layer onto the receiving medium to form print images having a metallic luster on said receiving medium.

4,892,603

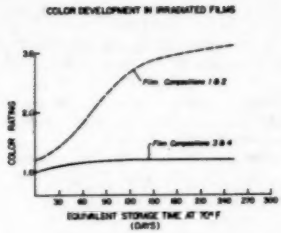
IRRADIATED MULTILAYER FILM FOR PRIMAL MEAT PACKAGING

Stanley Lustig, Park Forest; Jeffrey M. Schuetz, Woodridge, and Stephen J. Vicik, Darien, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Continuation of Ser. No. 134,657, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 744,680, Jun. 14, 1985, Pat. No. 4,714,638. This application Sep. 9, 1988, Ser. No. 243,133

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—244.11 **26 Claims**



1. A process for producing a multilayer film suitable for packaging primal and sub-primal meat cuts and processed meats comprising:

(a) co-extruding a first outer film layer, a core film layer comprising a vinylidene chloride-methyl acrylate copolymer, and a second outer film layer;

(b) biaxially stretching said multilayer film; and

(c) irradiating said multilayer film to a dosage level of between about 1 megarad and about 5 megarads.

4,892,604

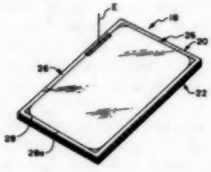
METHOD OF MAKING A STERILIZABLE MULTI-LAYER CONTAINER

Paul E. Messells, Palatine; William D. Johnston, Buffalo Grove; Peter C. Kwong, McHenry; Dean G. Laurin, Lake Zurich, and Leonard F. Czuba, Lombard, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 59,132, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 827,847, Feb. 7, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,295

Int. Cl.[4] B32B *31/26, 31/28*

U.S. Cl. 156—244.24 **9 Claims**



1. A method of fabricating a heat sterilizable stress-free container comprising the steps of:

forming first and second film members, each having at least two integral layers, the first of the layers formed of a material which is cross-linkable and free or essentially free of leachable plasticizers and which has a heat distortion temperature at or below 110° C., the first layer material being selectively cross-linkable to obtain the desired resistance to distortion at heat sterilization temperatures, the second of the layers formed of a material which, when

compared to the first layer material, is not cross-linkable and which has a heat distortion temperature above 110° C.;

positioning the first and second film members in overlapping relationship with corresponding first layers of each adjacent one another so as to form inner surfaces of the container;

melting a peripheral region of the overlapping, adjacent first layers of the container using heat sealing elements without pre-stressing said film members to form a peripheral seal between the inner first layers of the container;

irradiating the container so as to cross-link the first layers to obtain the desired resistance to melting; and

sterilizing the container by exposure to heat at or above 110° C. without pre-stressing the material, to form a non-stressed, non-heat shrinkable container.

4,892,605

PROCESS FOR PRODUCING A FURNITURE LAMINATE SHEET OR WEB

Manfred Schneider, Munich; Heinrich Heitz, Germering; Dieter Schlenz, Neufahrn, and Egon Ewald, Munich, all of Fed. Rep. of Germany, assignors to Alkor GmbH Kunststoffe, Munich, Fed. Rep. of Germany

Division of Ser. No. 899,037, Aug. 22, 1986, Pat. No. 4,767,667. This application Jun. 13, 1988, Ser. No. 184,956

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530290

Int. Cl.[4] B32B *31/12, 31/28*

U.S. Cl. 156—272.6 **13 Claims**

1. A process for producing a laminate comprising the steps of:

(a) providing a multi-layer web comprising a polyolefin web comprising an admixture of from 70 to 97.5 parts by weight of a first polymer material selected from the group consisting of propylene homopolymers and propylene copolymers, and from 5 to 30 parts by weight of a second polymer material selected from the group consisting of low pressure polyethylene, polyvinylalcohol, ethylene-vinylalcohol copolymers, ethylene-acrylic acid copolymers, ethylene-acrylate ester-acrylic acid copolymers and terpolymers, polycaprolactone, and mixtures and blends of low pressure polyethylene with at least one of the foregoing materials, and per 100 parts by weight of said first and second polymer material admixture, from 50 to 150 parts by weight of at least one finely divided mineral filler material, of which more than 60% includes a reactive material containing at least one polar group and at least one nonpolar group, said reactive material being present in an amount from 0.5 to 10 weight percent based on the weight of the filler, and a surface layer having a thickness from 3 to 30 microns applied over a front side of said polyolefin web;

(b) subjecting at least the back side of said polyolefin web of said multi-layer web to a radiation treatment, and

(c) adhesively bonding said back side of said polyolefin web of said radiation-treated multi-layer web to a wood material substrate.

4,892,606

OPTICAL RECORDING MEDIUM HAVING SPACE THEREIN AND METHOD OF MANUFACTURING THE SAME

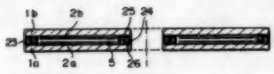
Takeshi Miyazaki; Tetsuro Fukui, both of Kawasaki, and Tsuyoshi Santoh, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,272

Claims priority, application Japan, Aug. 28, 1986, 61-199935; Sep. 10, 1986, 61-211473; Sep. 16, 1986, 61-215862; Sep. 16, 1986, 61-215863; Sep. 24, 1986, 61-223837; Oct. 8, 1986, 61-239850

Int. Cl.[4] B32B *31/12*; G11B *7/26*

U.S. Cl. 156—275.5 **9 Claims**



1. A method comprising the steps of:

forming an optical recording layer on at least one of a pair of substrates;

applying an adhesive mixture from a storage tank to part of at least one of the pair of substrates, said adhesive mixture being a dispersion of granular or filler-type spacing members in said adhesive, said spacing members having a specific gravity from 0.9 to 1.3 times that of the adhesive in said tank, the spacing members and the adhesive being mixed to prepare a mixture, said mixture being supplied in a small amount from said tank in each applic cycle;

adhering the pair of substrates while an optical recording layer faces inside; and

curing the adhesive.

4,892,607

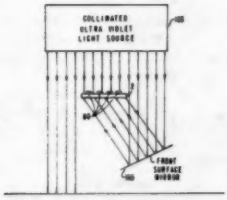
CHIP MOUNTING TECHNIQUES FOR DISPLAY APPARATUS

Frank J. DiSanto, North Hills, and Denis A. Krusos, Lloyd Harbor, both of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

Continuation of Ser. No. 938,147, Dec. 4, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 208,854

Int. Cl.[4] B32B *31/28*

U.S. Cl. 156—275.7 **5 Claims**



1. A method of bonding integrated circuits in a monolithic flat panel display comprising the steps of:

placing a spot of optical cement which is curable upon exposure to ultraviolet radiation on a surface of an integrated circuit to be bonded;

positioning said integrated circuit to be bonded on a first surface of a transparent display panel at a location adjacent to inputs and outputs of said display panel to be connected to said integrated circuit, said first surface and said surface forming an interface therebetween and said first surface of said display panel being disposed to support said integrated circuit; and

exposing said interface to collimated ultraviolet radiation through a second surface of said transparent display panel, which second surface is disposed on the opposite side of said display panel from said first surface, until said spot of optical cement becomes sufficiently tacky so as to hold said integrated circuit if said display panel were inverted, wherein said step of exposing includes placement of said first surface beneath a source of collimated ultraviolet radiation and includes employing a front surface mirror to direct collimated ultraviolet radiation from the source at an angle other than 90° through said second surface to said interface.

4,892,608

AUTOMATIC TRANSVERSE SPLICING DEVICE FOR UNCURED ELASTOMERIC SHEET MATERIAL

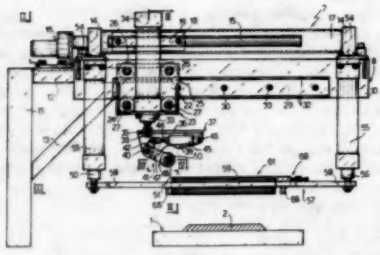
Roberto Lippa, Castel Romano, Italy, assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Filed Jan. 23, 1989, Ser. No. 299,589

Claims priority, application Italy, Jan. 22, 1988, 67039 A/88

Int. Cl.[4] B29D *30/06*; B65H *69/06*

U.S. Cl. 156—421 **7 Claims**



1. An automatic device for splicing uncured elastomeric sheet material along a predetermined transverse splicing line, said device being designed to cooperate with a surface supporting said material, said device comprising a number of blades arranged substantially perpendicular to, and facing said supporting surface and said splicing line, said blades being grouped together, in an axially-sliding manner to and from said supporting surface, into a displaceable pack extending along said splicing line and having a first lateral surface facing said supporting surface; approach means for enabling relative displacement of said pack and said supporting surface to and from an operative position wherein the material for splicing is retained between said pack and said supporting surface; and pressure means cooperating, in use, with a second surface of said pack, opposite said first surface, for axially thrusting said blades towards said supporting surface by successively applying a predetermined axial pressure on said blades.

4,892,609

AUTOMATIC MATERIAL FEEDER IN TIRE FORMING MACHINE

Heikichi Nakanome, and Takeshi Yonezawa, both of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

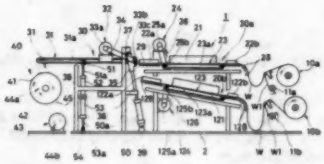
Continuation of Ser. No. 810,146, Dec. 18, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 133,180

Claims priority, application Japan, Dec. 23, 1984, 59-271032

Int. Cl.[4] B29D *30/30*

U.S. Cl. 156—406.4 **3 Claims**

1. An automatic feeder for feeding tire building material in a tire building machine, comprising a plurality of first feeders disposed in a multistage vertical arrangement on a material supplying side, each of said first feeders being provided with cloth inspection means, with automatic cutting apparatus, with centering apparatus and with a discharge portion; a single second feeder disposed at the discharge end of said discharge portion feeders of said first feeder for receiving tire building material from the discharge portion of a selected one of said first feeders and for guiding the tire building material to a tire forming drum, said second feeder having an inlet portion and a discharge portion; first moving means connected in said inlet portion of said second feeder and second moving means connected to said second feeder intermediate said inlet portion and said discharge portion of said second feeder, means for operating said first and second moving means for moving said inlet portion of said second feeder to the discharge portion of said selected one of said first feeders and to the one of said first feeders selected thereafter, respectively, for receiving tire



building material from said selected one of said first feeders; and third moving means aligned with said second moving means for moving said discharge portion of said second feeder with said receiving tire building material thereon into alignment with said tire forming drum for feeding said receiving tire building material from said discharge portion of said second feeder to said tire forming drum and for moving said discharge portion of said second feeder away from said tire forming drum after said tire building material is transferred to said tire forming drum, said each first feeder being further provided with a group of separating rollers at said discharge portion of said first feeders and driving means for driving said rollers independent of said first and second feeders and separating tire building material on said second feeder from tire building material on said selected first feeder.

4,892,610

AUTO REEL LOADER

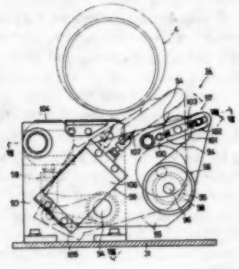
Shozo Sano, Hyogo, Japan, assignor to Kabushiki Kaisha Kaneda Kikai Seisakusho, Osaka, Japan

Filed Jan. 30, 1989, Ser. No. 303,210

Claims priority, application Japan, Sep. 6, 1988, 63-223100

Int. Cl.[4] B66F *9/14*

U.S. Cl. 156—446 **5 Claims**



1. An auto reel loader having a plate on which a truck may be loaded and a used up paper roll holder for receiving a used up paper roll from the paper roll reel of a rotary press and transferring the used-up paper roll to the truck, said auto reel

loader being characterized in that it is provided with a fastening means which may be moved into proximity of said paper roll reel, said fastening means including means for applying an adhesive tape to the outer circumferential surface of a used-up paper roll on the paper roll reel to thereby secure a remaining strip of paper on the used-up paper roll.

4,892,611

KNIFE WHEEL ASSEMBLY SUITABLE FOR FORMING A BUTT SPLICE

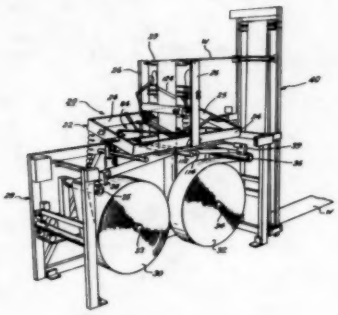
Roger R. Wheeler, Roscoe, and John R. Martin, Rockford, both of Ill., assignors to Martin Automatic, Inc., Rockford, Ill.

Continuation of Ser. No. 153,578, Jan. 29, 1988, Pat. No. 4,801,342, which is a continuation of Ser. No. 907,117, Sep. 12, 1986, abandoned. This application Jul. 18, 1988, Ser. No. 221,023

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[4] **B31F** *5/06;* **B65H** *69/06*

U.S. Cl. 156—504 **14 Claims**



1. In an apparatus for forming a butt splice to join together, by a piece of adhesive tape, a web from a new roll of material to a web which is from an expiring roll of material and which is being run, downstream from the expiring roll, under tension along a pre-determined path of travel that includes running web storage means, with the apparatus including: an anvil means disposed adjacent to the path of travel and having first and second sides and a cutting edge at the downstream ends of the sides; means for supporting the expiring roll and the new roll so that each web on each roll may run off of the roll and past the anvil means; means for selectively holding a portion of the web from the new roll against the first side of the anvil means; means for selectively trimming off the web from the ne roll along the cutting edge of the anvil means so that the trimmed edge of the leading end of the web from the new roll is aligned with and conforms to the cutting edge of the anvil means and so that a piece of adhesive tape can be applied to one side of the leading end, with the adhesive on the adhesive tape facing the path of travel and with an exposed portion of the adhesive tape projecting downstream beyond the cutting edge of the anvil means and the trimmed edge of the web from the new roll; means for momentarily stopping the running of the portion of the web from the expiring roll adjacent to the anvil means while permitting the further downstream portions of the web from the expiring roll, remote from the anvil means, to continue to run under tension; means for selectively holding the stopped, anvil adjacent portion of the web from the expiring roll against the second side of the anvil means; and means for permitting a joined leading end of the web from the new roll and trailing end of the web of the expiring roll to run again, along the path of travel, with the further downstream portions of the web of the expiring roll; the improvement comprising:

a knife wheel assembly including a roller that is disposed, in relation to the anvil means, downstream from the cutting edge of the anvil means and a knife edge that is aligned with the cutting edge of the anvil means, with both the roller and the knife edge being adjacent with the second side of the anvil means and to one side edge of the web from the expiring roll; and

means for moving the knife wheel assembly across the web from the expiring roll, from its one side edge to its other side edge, after the web from the expiring roll has been momentarily stopped adjacent to the anvil means, with this movement of the knife wheel assembly causing: (A) the knife edge to cut the stopped, anvil adjacent portion of the web from the expiring roll a part at a time, across the web and beginning at the one side edge thereof, so that the point of cutting moves across the stopped, anvil adjacent portion of the web from the expiring roll from the one side edge to the other side edge, so that the uncut part of the web from the expiring roll remains under tension ahead of the point of cutting, and so that the trimmed edge of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll is aligned with and conforms to the cutting edge of the anvil means and; (B) the roller to apply the cut part of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll, behind the point of cutting, to the downstream extending, exposed portion of the adhesive tape substantially simultaneously as the point of cutting moves across the stopped, anvil adjacent portion of the web from the expiring roll so that the trimmed edge of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll abuts and is disposed closely adjacent to the trimmed edge of the leading end of the web from the new roll, and so that the adhesive tape secures together the leading end of the web from the new roll and the trailing end of the web from the expiring roll.

4,892,612

POLISHING METHOD

John E. Huff, 4102 W. Wagon Wheel Dr., Phoenix, Ariz. 85051

Filed Oct. 11, 1988, Ser. No. 255,801

Int. Cl.[4] **H01L** *2/306;* **B44C** *1/22*

U.S. Cl. 156—636 **7 Claims**

1. In the method of polishing the surfaces of silicon wafers sliced from single crystal ingots with a silica sol-amine combination, the improvement comprising selecting the amine from the group of water-soluble alkanolamines, providing sufficient amine so that at least 2.0 pbw are present for each 10 pbw of SiO_2 and adding no alkali metal hydroxide or ammonium hydroxide to said silica sol-alkanolamine combination upon dilution or during polishing.

4,892,613

PROCESS FOR ETCHING LIGHT-SHIELDING THIN FILM

Noboru Motai, Tochigi; Sakae Tanaka; Yoshiaki Watanabe, both of Tokyo; Katsuo Shirai; Yaeko Suzaki, both of Tochigi; Yoshihisa Ogiwara, Tochigi; Kazunori Saito, Tochigi, and Keiko Shibuki, Tochigi, all of Japan, assignors to Nippon Precision Circuits Ltd. and Seikosha Co., Ltd., both of Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,076

Claims priority, application Japan, Dec. 29, 1987, 62-336682; Dec. 2, 1988, 63-305763

Int. Cl.[4] **C23F** *1/02;* **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—643 **4 Claims**

1. A process for etching a light-shielding thin film which comprises the steps of:

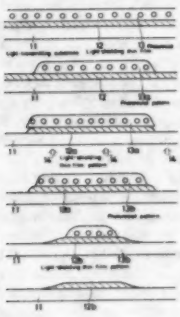
applying a photoresist to a light-shielding thin film formed on a light-transmitting substrate;

exposing the photoresist and then developing the exposed photoresist, thereby forming a photoresist pattern of desired shape;

etching the light-shielding thin film by using the photoresist

pattern as a mask, thereby forming a light-shielding thin film pattern matching the photoresist pattern;

exposing the photoresist pattern through the reverse side of the light-transmitting substrate by using the light-shielding



thin film pattern as a mask and then developing the exposed photoresist pattern, thereby reducing the size of the photoresist pattern; and

etching the light-shielding thin film pattern by using the reduced size photoresist pattern as a mask.

4,892,614

INTEGRATED CIRCUIT ISOLATION PROCESS

Richard A. Chapman, Dallas, and Clarence W. Teng, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 882,732, Jul. 7, 1986, Pat. No. 4,842,675. This application Mar. 10, 1989, Ser. No. 321,699

Int. Cl.[4] B44C *1/22;* **H01L** *21/306;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **14 Claims**

1. A method of fabricating an isolation region at a surface of a semiconductor body, comprising:

etching a recess having sides and a bottom into said surface of said semiconductor body, a portion of said surface not within said recess defined as an active region;

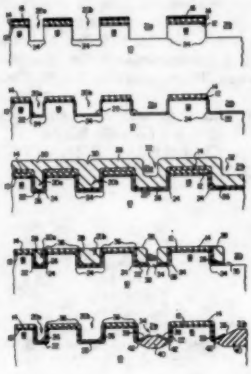
forming an oxidation mask over said active region and along the sides and bottom of said recess;

forming a masking layer over said oxidation mask, said masking layer having a portion near the center of said recess which is thinner than the portion of said masking layer near the sides of the recess;

etching said masking layer so that the thinner portion of the masking layer is removed and so that portions of said masking layer remain within said recess near the sides of said recess;

removing a portion of said oxidation mask at the bottom of said recess at the location not covered by the remaining portions of said masking layer near the sides of said recess;

oxidizing a portion of said bottom of said recess at the location from which the portion of said oxidation mask was removed, to form a first oxide layer thereat;



depositing a second oxide layer over said active region and into said recess after said oxidizing step; and

etching said second oxide layer over said active region.

4,892,615

METHOD FOR DECONTAMINATION OF A CHAMBER USED IN VACUUM PROCESSES FOR DEPOSITION, ETCHING AND/OR GROWTH OF HIGH PURITY FILMS

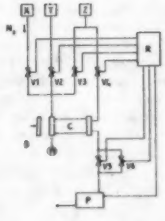
Antonino Motta, Milan, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed Dec. 2, 1987, Ser. No. 127,952

Claims priority, application Italy, Dec. 2, 1986, 22532 A/86

Int. Cl.[4] B44C *1/22;* **B05D** *3/06;* **C23C** *14/00*

U.S. Cl. 156—643 **5 Claims**



1. A method for decontamination of a chamber used in vacuum processes for deposition, etching and/or growth of high purity films which comprises:

introducing into a chamber products to be processed as high purity films,

creating a vacuum in said chamber containing said products by pumping so that the pressure in said chamber is reduced to a first minimum pressure value of at least about 25 mTorr,

purging said chamber by introducing therein a non-contaminating gas until a second pressure is reached higher than said first minimum value pressure,

and repeating the above purging and pumping steps, such that the flow of said non-contaminating gas is intermittent and decontamination is realized by said series of purgings and pumping steps.

4,892,616

PROCESS FOR STRIPPING COLOR FILTER ARRAYS FROM SUBSTRATES

Bertalan J. Vegh, Fairport, and Laurel J. Pace, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1988, Ser. No. 263,940
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; B29B *37/00*
U.S. Cl. 156—655 **6 Claims**

1. A process for stripping a color filter array coating from a substrate of a solid-state color image sensing device to recover the substrate which subsequently can be used to produce another solid-state color image sensing device, said process comprising contacting said color filter array coating with a stripping solution comprising chromic acid and sulfuric acid for a time effective to remove said coating from said substrate.

4,892,617

PROCESSES INVOLVING LITHOGRAPHIC MATERIALS

Frank S. Bates, Summit; Mark A. Hartney, Westfield, and Anthony E. Novembre, Union City, all of N.J., assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 643,156, Aug. 22, 1984, abandoned. This application Oct. 19, 1987, Ser. No. 110,630
Int. Cl.[4] B44C *1/22*; G03C *5/00*
U.S. Cl. 156—659.1 **6 Claims**

1. A process for fabricating a structure comprising the steps of forming a region of radiation delineable material on a substrate, delineating said material by exposing the material to a pattern of radiation and developing the pattern and employing said delineated material as a dry etch mask to transfer said pattern to said substrate in continuing said fabrication.

CHARACTERIZED IN THAT

said material comprises a polymer including at least a first and second segment, said first and second segments each imparting a distinct chemical property to said polymer wherein each segment includes at least 10 monomer units, wherein said first and second segments are compositionally different, and wherein the distinct chemical property of the first segment is chosen to improve the step of delineating said material and the distinct chemical property of the second segment is chosen to improve the said dry etch transfer.

4,892,618

METHOD FOR THE MANUFACTURE OF PRODUCTS CONTAINING WOOD CHIPS BY INSOLUBILIZING THE LIGNIN

Rune Simonson, Sotenäsvägen 64, S-433 64 Partille, and Brita Ohlsson, N. Stommen 318, S-438 00 Landvetter, both of Sweden

Continuation of Ser. No. 848,207, Apr. 4, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 147,049
Claims priority, application Sweden, Apr. 4, 1985, 8501688
Int. Cl.[4] B27N *3/04, 1/02*; D21J *1/04*
U.S. Cl. 162—16 **8 Claims**

1. A method for the manufacture of moisture resistant products from wood chips by compression and adhesive bonding comprising the steps of

(a) transforming lignin into water-soluble form by dissolving lignin and water-soluble derivatives thereof in an aqueous solution of pH 12.5 or less;

(b) impregnating the wood chips and the cells of the wood chips with said aqueous lignin solution

(c) treating the chips impregnated with said water-soluble lignin so it will not leach from said wood chips, by insolubilizing the lignin within the wood chips by impregnating the chips with a weakly acid aqueous solution of a metal salt in a further impregnating step;

(d) drying said chips containing insolubilized lignin;

(e) coating the outer surfaces of the wood chips impregnated with the insolubilized lignin with glue;

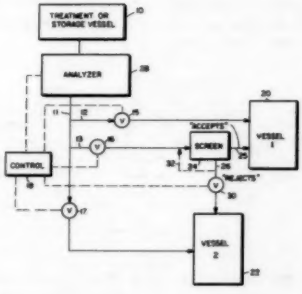
(f) and then compressing the coated chips to form said product.

4,892,619

METHOD OF PRODUCTION OF FIBER CONTAINING PULP WITH DIFFERENT RAW MATERIALS

Goran Tistad, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Apr. 1, 1988, Ser. No. 177,472
Claims priority, application Sweden, Apr. 6, 1987, 87014239
Int. Cl.[4] D21F *7/06*
U.S. Cl. 162—49 **14 Claims**



1. A method of continuously producing cellulosic fibrous material pulp during changeover of a pulp production process from a first raw material for continuously producing a first pulp having a first property, to a second raw material for continuously producing a second pulp having a second property different from the first property, so as to minimize waste of the pulp while maintaining the integrity of the final pulp produced, comprising the steps of continuously:

(a) feeding the continuously produced first pulp to a first location for storage or treatment thereof;

(b) after changeover to the second raw material, feeding the pulp mixture produced during changeover from the first to the second raw material, which pulp mixture has pulp

with both said first and second properties, to a screening station;

(c) at the screening station separating the pulp mixture into separate pulp fractions according to the different first and second properties of the pulps making up the pulp mixture;

(d) feeding the separated pulp fractions, one fraction comprising substantially all first pulp and the other fraction substantially all second pulp, to different locations for storage or treatment of the first and second pulps; and

(e) once the pulp mixture contains substantially all second pulp, terminating steps (b) and (c) and feeding the second pulp to a second location for storage or treatment thereof.

4,892,620

DIURETHANE LATEX AND PROCESSES

Catherine Beuzelin, Paris, and Claude Senez, Gouvieux, both of France, assignors to Atochem, Paris La Defense, France

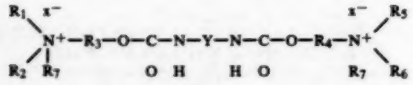
Division of Ser. No. 3,790, Jan. 16, 1987, Pat. No. 4,786,330. This application Aug. 8, 1988, Ser. No. 230,934

Claims priority, application France, Jan. 24, 1986, 86 00997

Int. Cl.[4] D21H *3/12*

U.S. Cl. 162—158 **8 Claims**

1. A process of sizing a paper comprising adding to the paper the sizing agent in an amount sufficient to size the paper and then drying the paper, said sizing agent utilizable in a neutral medium consisting essentially of a latex consisting essentially of at least one diurethane dispersed in an aqueous medium, said diurethane being of the formula:



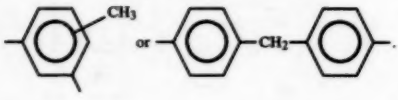
in which:

(a) R_1, R_2, R_5 and R_6 are each alkyl radicals and at least one of them possesses a medium of 7 carbon atoms;

(b) R_7 and x represent, respectively, the cationic and anionic portions of the quarternizing agent R_7x;

(c) R_3 and R_4 are selected from C_2–C_4 alkylene radicals or polyalkoxylated radicals of a degree of polycondensation of between 1 and 4; and

(d) Y is



4,892,621

METHOD AND DEVICE FOR MEASURING PERMEABILITY/PENETRABILITY OF FABRIC IN A PAPER MACHINE

Pekka Eskelinen, Karhula, Finland, assignor to Valmet Paper Machinery, Inc., Finland

Filed Sep. 23, 1988, Ser. No. 249,358

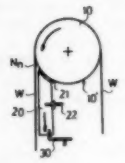
Claims priority, application Finland, Sep. 23, 1987, 874161

Int. Cl.[4] D21F *7/00*; G01N *15/08*

U.S. Cl. 162—198 **20 Claims**

1. Method for measuring air penetrability or permeability of fabric in a paper machine, in which the fabric passes over at least one roll with a positive pressure formed in an inlet nip between a face of the roll and the moving fabric at an inlet side of the roll and a negative pressure formed in an outlet nip between the moving fabric and the roll face at an outlet side of the roll, the positive and negative pressures depending upon the permeability or penetrability of the fabric, comprising the steps of

mounting at least one device adjacent the fabric and roll and which is sealed with respect to the moving roll face so that an at least partially closed pressure space is formed between said device, the roll face and the fabric,



measuring pressure out of said pressure space while the fabric moves, to thereby obtain a measured pressure value, and

calculating the permeability or penetrability of the fabric from the measured pressure value.

4,892,622

METHOD FOR RESISTING FORMATION OF UNDULATIONS IN A FIBER/WATER MIXTURE DURING FORMING OF A PAPER WEB IN A PAPER-MAKING MACHINE

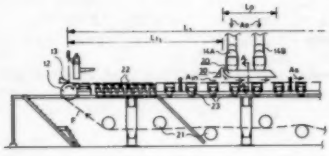
Raimo Malkki; Paavo Jaatinen, both of Lappeenranta; Timo Haverinen; Pekka Eskelinen, both of Turku; Juhani Jokinen, Masku; Vesa Vuorinen; Raimo Virta, both of Turku, and Martti Salmivaara, Littoinen, all of Finland, assignors to Valmet Oy and Kymmene Oy, both of, Finland

Filed Aug. 20, 1987, Ser. No. 87,400

Claims priority, application Finland, Aug. 22, 1986, 863411

Int. Cl.[4] D21F *1/00*

U.S. Cl. 162—208 **9 Claims**



1. A method of resisting formation of undulations in a fiber/-water mixture supported by a forming wire during forming of a paper web in a high-speed, paper-making process, comprising the steps of:

jointly advancing the fiber/water mixture and the forming wire during the forming of the paper web along an advancement path at a web velocity; and

moving a mass of air directly above and extending over a direction transverse to said advancement path, in the same direction as said advancing of the fiber/water mixture and only partly along said advancement path during forming of the paper web, and at an air velocity generally equal in magnitude to said web velocity;

wherein said moving step is commenced at a point downstream of commencement of said joint advancing step;

wherein the advancing and moving steps are performed at web and air velocities on the order of 1000 m/min and higher;

directing the mass of air substantially over the entire width of the web;

wherein the advancing step is performed in a paper-making machine of the type having a forming station at which the fiber/water mixture is supplied from a lip slice of a headbox onto the forming wire;

wherein the moving step is performed at an air-moving station within the forming station;

wherein the moving step includes the steps of commencing a flow of air mass at a predetermined location downstream of the lip slice, and

continuing the air mass flow over a predetermined distance along the advancement path;

wherein the commencing step is performed at said predetermined location which is greater than two meters from the lip slice; and

wherein the moving step includes feeding air into and through the air-moving station, and forming a moving air curtain which blankets the fiber/water mixture within and exiting the air-moving station, and

the moving air curtain is formed by feeding air through a plurality of nozzles successively arranged along the advancement path, each nozzle extending along the transverse direction to emit air across the width of the fiber/-water mixture.

4,892,623

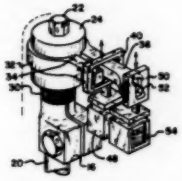
TWO-SPEED STEPPER ACTUATOR

Gordon K. Reed, Bexley, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Feb. 17, 1989, Ser. No. 311,915

Int. Cl.[4] D21F 1/02

U.S. Cl. 162—344 **13 Claims**



1. A stepper acuator for rotationally driving a member about an axis of rotation, said actuator comprising in combination:

a clamp in engagement with said member to be rotationally driven;

said clamp including opposed clamping legs in spaced, substantially parallel relation:

said legs extending transversely to said axis of rotation;

means for moving said legs toward each other to clamp said member to be rotationally driven; and

cam means engaging one of said legs to provide measured rotational movement of said clamp and said member to be rotationally driven, upon movement of said cam means when said member is clamped said cam means being structured and arranged to provide for the member to be driven at at least two different speeds.

2. The actuator of claim 1 in which the member to be rotationally driven is in combination with said actuator and is a power nut attached to a spindle clamp to linearly drive a spindle.

4,892,624

WORKUP OF DISTILLATION RESIDUES FROM THE PURIFICATION OF CAPROLACTAM

Hugo Fuchs, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,215

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729853

Int. Cl.[4] B01D 3/34; C07D 201/16

U.S. Cl. 203—37 **5 Claims**

1. A process for the recovery of caprolactam from a distillation residue containing caprolactam, oligomers of caprolactam, polymers of caprolactam and unidentified decomposition and reaction products, which process comprises

(a) adding to said distillation residue sodium or potassium hydroxide and per part by weight of distillation residue from 0.1 to 10 parts by weight of high boiling hydrocarbons having a boiling point above 250° C. up to 450° C.,

(b) heating the mixture of said distillation residue, sodium hydroxide or potassium hydroxide, and high boiling hydrocarbons to a temperature of from 250° to 450° C., and

(c) removing continuously vaporized caprolactam from said heated mixture.

4,892,625

METHOD FOR PRODUCING HIGH PURITY CHEMICALS

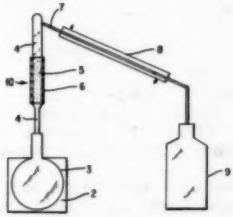
Shumpei Shimizu, Moses Lake, Wash.; Mamoru Yoshizako, Machida, Japan, and Toshitsura Cho, Kawasaki, both of Japan, assignors to Tama Chemicals Co., Ltd., Japan and Moses Lake Industries, Inc., Japan

Filed Jun. 23, 1987, Ser. No. 65,481

Claims priority, application Japan, Jan. 27, 1987, 62-015219

Int. Cl.[4] B01D 3/00

U.S. Cl. 203—86 **4 Claims**



1. A method for the distillation in a distillation device of an inorganic acid having non-volatile matter impurities therein, said distillation device comprising a heating section, a contacting section and a condensing section, to obtain the inorganic acid essentially free of non-volatile matter impurities, said method consisting essentially of:

(a) boiling the inorganic acid in the heating section to form vapors of the inorganic acid;

(b) contacting the vapors of the inorganic acid from the heating section with a contact member inert to said vapors in the contacting section, said vapors being passed through the contacting section at a flow rate of 0.01 to 10 sec^{-1} per unit volume of the contacting section;

(c) heating the contacting section at a temperature of 1 to 100° C. higher than the boiling point of the inorganic acid being distilled and maintaining the inorganic acid completely vaporized in the contacting section; and

(d) condensing the vapors from the contacting section in the condensing section.

4,892,626

METHOD FOR PLATING ONE SIDE OF A WOVEN FABRIC SHEET

James H. Covey, Snohomish, Wash., assignor to Boeing Company, Seattle, Wash.

Filed Jan. 21, 1988, Ser. No. 146,418

Int. Cl.[4] C25D 5/02

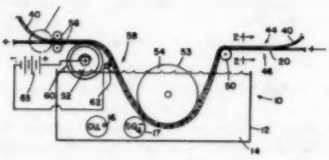
U.S. Cl. 204—15 **12 Claims**

1. A method for plating one side of individual fibers in a fabric sheet with a conductive material, comprising the steps of:

removably attaching a flexible backing sheet to an upper side of a fabric sheet having individual fibers woven so as to form interstices therebetween;

immersing the fabric and backing sheets into an electrolytic solution containing a desired metallic ion for deposition on the fabric sheet, wherein the fabric and backing sheets are oriented and introduced into the solution so that air pockets are formed at the interstices, whereby only the backing sheet and a lower surface of each fiber are wetted;

positioning a first electrode against the fabric sheet;



positioning a second electrode against the lower peripheral surfaces of the fibers;

applying an electric potential between the electrodes to generate an electric field through the fabric sheet to bond the metallic ions to the lower surfaces of the fibers; and removing the backing sheet.

4,892,627

METHOD OF NICKEL-TUNGSTEN-SILICON CARBIDE COMPOSITE PLATING

Koji Takada, Nagoya, Japan, assignor to Takada Laboratories, Inc., Japan

Filed Apr. 27, 1989, Ser. No. 344,226
Claims priority, application Japan, Feb. 18, 1989, Hei 1-37330
Int. Cl.[4] C25D *15/00*
U.S. Cl. 204—16 **1 Claim**

1. A method of nickel-tungsten-silicon carbide composite plating comprising the steps of:

preparing a plating bath having the following composition;

nickel sulfate	0.12–0.16 mol/L
sodium tungstate	0.17–0.23 mol/L
ammonium citrate	0.30–0.50 mol/L
pH	6.0–8.0
bath temperature	60–80

dispersing fine powder of silicon carbide having a grit size of 0.8–1.5 μm in said plating bath with a concentration of 20–60 g/L; and

causing electrolysis in said plating bath while mechanically agitating said plating bath, with a cathode current density of 10–30 A/dm^2 by use of a stainless steel plate as an anode.

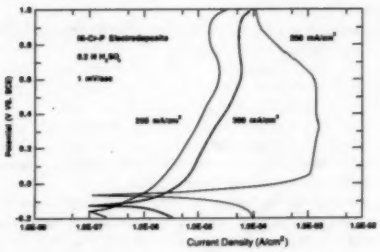
4,892,628

ELECTRODEPOSITION OF AMORPHOUS TERNARY NICKEL-CHROMIUM-PHOSPHORUS ALLOY

Terry R. Guilinger, Albuquerque, N. Mex., assignor to The United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1989, Ser. No. 338,013
Int. Cl.[4] C25D *3/56*
U.S. Cl. 204—44.7 **10 Claims**

1. A method of forming amorphous ternary nickel-phosphorus-chromium alloy deposits by electrodeposition on an electrically conductive substrate, comprising subjecting said substrate to an applied current density between about 20 and 40 A/dm^2 at a temperature from the range of about 20 ° to 30° C. in a bath comprising: a chromium salt and a nickel salt in a weight ratio of about 3:1, a phosphorus source at about 0.3M P



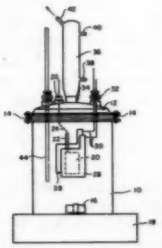
concentration; about 0.3M of a complexing agent; about 0.1M of a supporting salt; and about 1.0M of buffer.

4,892,629

ELECTROCHEMICAL PREPARATION OF SILVER OXIDE ELECTRODES HAVING HIGH THERMAL STABILITY

Daniel R. Glen, Baltimore, Md.; Azzam N. Mansour, Fairfax Station, Va.; Kathleen M. O'Neill, Silver Spring, Md.; Steven Dallek, Beltsville, Md., and Benjamin F. Larrick, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1989, Ser. No. 389,219
Int. Cl.[4] C25D *11/02*
U.S. Cl. 204—56.1 **7 Claims**



1. In the process for preparing AgO cathodes by anodizing silver plaques in basic electrolytes, the improvement comprising:

performing the anodizing process at a temperature in the range of from about 70° C. to just under the reflux temperature of the electrolyte.

4,892,630

PROCESS FOR THE PASSIVATING ANODIZATION OF COPPER IN A MEDIUM OF MOLTEN FLUORIDES, AND USE FOR THE PROTECTION OF COPPER PARTS OF FLUORINE ELECTROLYSERS

Patrick Germanaz, Aix en Provence; Sylvie Lamirault, Voiron, and Gerard Picard, Fontenay Sous Bois, all of France, assignors to Comurhex Societe Pour la Conversion de l'Ranium en Metal et Hexafluorure, Courbevoie, France

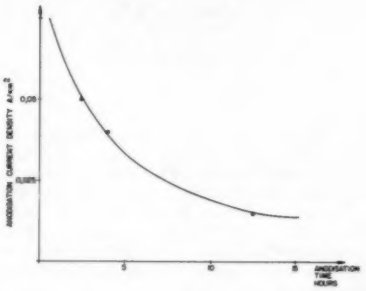
PCT No. PCT/FR88/00334, § 371 Date Feb. 23, 1989, § 102(e) Date Feb. 23, 1989, PCT Pub. No. WO88/10328, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 23, 1988, Ser. No. 343,145

Claims priority, application France, Jun. 26, 1987, 87 09574

Int. Cl.[4] C25D *11/02*

U.S. Cl. 204—59.5 13 Claims



1. A process for the passivating anodisation of copper parts in a liquid KF-xHF medium, where x is about 2, which makes it possible to produce a mechanically and electrically strong, adherent protective layer, with a high rate of covering of the copper substrate, comprising immersing said parts in the liquid KF-xHF bath they and subjecting said immersed parts to an anodic current of a surface-related density, calculated with respect to the immersed surface of copper to be treated, of lower than 0.1 A/dm^2.

4,892,631

RECOVERY OF PRECIOUS METALS FROM COMPLEX ORES

Merwin G. White, P.O. Box 404, Moapa, Nev. 89025

Filed Jun. 20, 1988, Ser. No. 208,758

Int. Cl.[4] C25C *1/20*; C22B *4/00*

U.S. Cl. 204—109 4 Claims

1. A method of recovery of precious metals from complex ores comprising

(a) heating a complex ore having a precious metal inquart added thereto before heating and a base metal in an electric arc furnace to smelt precious metal values contained in the ore into the base metal;

(b) transferring the base metal having precious metal values smelted therein in an acid-proof bag to an electrolytic cell;

(c) positioning the base metal to be an anode of the cell;

(d) subjecting the cell to a direct positive current whereby the base metal and unresolved complex values are plated out on a cathode of the cell and the resolved precious metal remain in the bag in the form of an anode mud; and

(e) smelting and electrolyzing the anode mud to recover a rich anode mud.

4,892,632

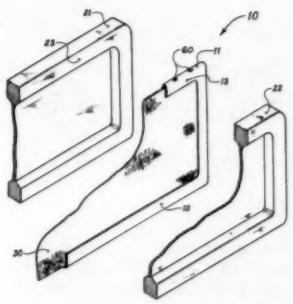
COMBINATION SEAL MEMBER AND MEMBRANE HOLDER FOR AN ELECTROLYTIC CELL

Gregory J. E. Morris, Milan, Italy, assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,070

Int. Cl.[4] C25B *1/26, 9/00, 13/00*; B65D *53/00*

U.S. Cl. 204—128 8 Claims



8. A method of operating an electrolytic cell comprising:

(a) providing a seal member comprising a solid body structure in a picture frame type configuration having a groove therein forming a U-shaped member when viewed in cross-section, the bottom of the "U" of the U-shaped member forming the outside perimeter surface of the frame configuration and the "arms" of the U-shaped member forming the groove disposed toward the inside perimeter surface of the frame configuration, the groove adapted for holding the edge of a sheet-like member therein such that a space between the edge of the sheet-like member and the inside of the groove is formed, said structure having at least one orifice interconnecting the groove and the outside perimeter surface of the structure, said orifice adapted for venting any gases or liquid present in the space formed between the edge of the sheet-like member and the groove;

(b) inserting a sheet-like separator in the groove of the U-shaped seal member;

(c) interposing the seal member with separator between at least a first frame member and a second frame member, the separator spacing apart an anode and a cathode compartments defined by the first and second frame members and the separator;

(d) compressing the seal member with separator and the first and second frame members together;

(e) feeding an aqueous alkali metal halide solution to the electrolytic cell; and

(f) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

4,892,633

MAGNETRON SPUTTERING CATHODE

Richard P. Welty, Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 271,100, Nov. 14, 1988. This application Apr. 11, 1989, Ser. No. 336,243

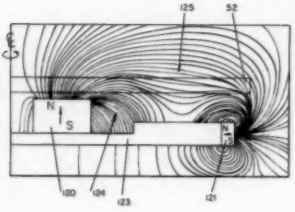
Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—192.12 27 Claims

18. A method of increasing the target utilization in a magnetron sputtering process wherein a glow discharge plasma is magnetically confined to a region adjacent to and above the target, said target having a front surface, a body and back surface, comprising:

utilizing magnet means that generate magnetic flux lines which form a closed-loop magnetic tunnel adjacent to said

front surface of said target and within said target body; the curvature of said magnetic flux lines in the center of said tunnel changing progressively from concave, to flat, to convex with increasing distance from said magnet means; in the region where said magnetic flux lines are flat, the flat area is at least 20% of the width of said magnet means,



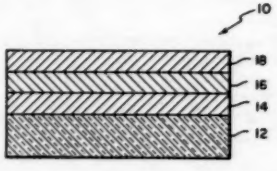
in which at least a portion of said magnetic tunnel has said flat region oriented at an angle to said front surface of said target, and is located substantially at said front surface of said target; and in the region where said magnetic flux lines are concave, said concave area is located substantially within said target body.

4,892,634

METHOD OF PREPARING THERMO-MAGNETO-OPTIC RECORDING ELEMENTS

David A. Glocker, W. Henrietta, N.Y., and Geoffrey C. Lesh, Sunnyvale, Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,322
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.15 **10 Claims**



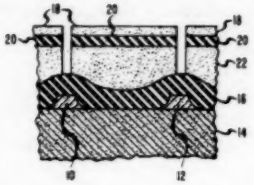
1. In a method of making a thermo-magneto-optic recording element by applying a first ceramic barrier layer contiguous to a polymeric substrate, applying a thermo-magneto-optic layer on the surface of the barrier layer opposite to that in contact with the substrate and applying a second barrier layer to the surface of the thermo-magneto-optic layer opposite to the surface in contact with the first barrier layer, the improvement which comprises subjecting the substrate, prior to the application thereto of the first barrier layer, to an RF oxygen plasma glow discharge or etch treatment at a power of from about 30 to about 200 watts for a period of time of from about 5 to about 180 seconds, the multiple of power and time not to exceed 2500 watt-seconds.

4,892,635

PATTERN TRANSFER PROCESS UTILIZING MULTILEVEL RESIST STRUCTURE FOR FABRICATING INTEGRATED-CIRCUIT DEVICES

Avinoam Kornblit, Highland Park, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 878,606, Jun. 26, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 153,579
Int. Cl.[4] H01L *21/312*
U.S. Cl. 204—192.36 **7 Claims**



1. A method for fabricating an integrated-circuit device comprising the steps of forming a multilevel structure that includes a relatively thin patterned masking layer comprising a material selected from the group consisting of resist material and silicon dioxide overlying a relatively thick planarizing layer comprising a hardened polymer on a substrate, forming a pattern including at least one structure having a dimension of 1 micron or less in said thin patterned masking layer, transferring said pattern by

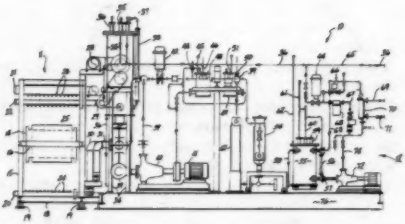
anisotropically etching said planarizing layer in a reaction chamber in a plasma derived from carbon dioxide to transfer the pattern of said relatively thin masking layer into said relatively thick planarizing layer, wherein the resolution of said pattern during said transfer is not substantially degraded, and wherein the time taken to effect said transfer is not substantially longer compared to the time required to transfer said pattern with the same resolution utilizing an oxygen plasma.

4,892,636

MODULAR ELECTROLYTIC CELL AND PROCESSING APPARATUS

Roger E. Bolick, II, Chattanooga; David W. Cawlfield, and Kenneth E. Woodard, Jr., both of Cleveland, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 17, 1988, Ser. No. 207,798
Int. Cl.[4] C25B *9/00, 15/08*
U.S. Cl. 204—237 **31 Claims**



1. A modular electrolytic cell apparatus and processing apparatus for the electrolytic production of a chemical product, the modular cell and processing apparatus being easily assembled and disassembled for transport separately to a remote operating site, comprising in combination:

(a) generally horizontally positioned electrolytic cell support means defining the base of an electrolytic cell apparatus module;
(b) cell support structure means having generally vertically extending means connected to the generally horizontally positioned electrolytic cell support means;
(c) an electrolytic cell mounted to the cell support structure means;
(d) anolyte circulation means connected to the cell for supplying anolyte feed fluid to the electrolytic cell and for carrying anolyte fluid away therefrom;
(e) catholyte circulation means connected to the cell for supplying catholyte feed fluid to the electrolytic cell and for carrying catholyte fluid away therefrom, the electrolytic cell and the anolyte and catholyte circulation means being transportable as a separate assembled unit comprising the electrlytic cell apparatus module;
(f) generally horizontally positioned processing apparatus support means defining the base of the electrolytic cell processing apparatus module;
(g) an anolyte disengager mounted to the generally horizontally positioned processing apparatus support means and connectable to the anolyte circulation means;
(h) a catholyte disengager mounted to the generally horizontally positioned processing apparatus and connectable to the catholyte circulation means;
(i) anolyte processing circulation means connected in fluid flow communication with the anolyte disengager for transporting anolyte through the processing apparatus and mounted to the processing apparatus support means;
(j) catholyte processing circulation means connected in fluid flow communication with the catholyte disengager for transporting catholyte through the processing apparatus and mounted to the processing apparatus support means;
(k) anolyte pump means mounted to the processing apparatus support means and connected to the anolyte processing circulation means for continuously circulating the anolyte therethrough between the electrolytic cell and the processing apparatus;
(l) catholyte pump means mounted to the processing apparatus support means and connected to the catholyte processing circulation means for continuously circulating the catholyte therethrough between the electrolytic cell and the processing apparatus; and
(m) control means for controlling the flow of anolyte fluid and catholyte fluid through the processing apparatus, the processing apparatus mounted to the processing apparatus support means being transportable as a separate assembled unit comprising the processing apparatus module.

4,892,637

PLASTIC-BOUND GAS DIFFUSION ELECTRODE CONTAINING A MANGANESE OXIDE CATALYST AND PROCESS FOR PREPARING SAME

Hans Sauer, Idstein, and August Winsel, Kelkheim, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,591

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722019

Int. Cl.[4] C25B *11/04, 11/06*

U.S. Cl. 204—291 **18 Claims**

14. A biporous gas diffusion electrode of improved cathodic load potential which is gas and liquid permeable and which consists essentially of from about 15 to about 65 percent of catalytic manganese oxide as, $Mn_2O_3 \times Mn_5O_8$ with Mn_2O_3 being predominate, and from about 15 to 35 percent of polytetrafluoroethylene (PTFE) and a carbon-containing conductive agent.

4,892,638

INSTRUMENT FOR DETERMINATION OF THE BASE SEQUENCE OF DNA

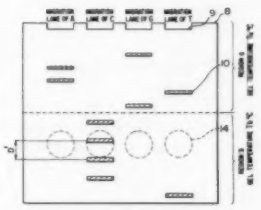
Kenichi Watanabe, Kudamatsu; Tamotu Simada, Akishima; Keiichi Nagai, Higashiyamato; Jirou Tokita; Ryusei Nakano, both of Kokubunji, and Tomoaki Sumitani, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,220

Claims priority, application Japan, Nov. 4, 1986, 61-260740

Int. Cl.[4] G01N *27/28, 27/26*

U.S. Cl. 204—299 R **4 Claims**



1. An instrument for determination of the base sequence of deoxyribonucleic acid (DNA) which is designed to detect DNA fragments in course of gel electrophoresis in real time to determine the base sequence of DNA, and comprises:
an electrophoretic gel (8), supported between a first and a second plate (7 and 6) and having a well (9) at an upper end thereof to which DNA fragments are to be supplied;
a first buffer solution tank (1) attached to the upper side of said gel which contains a first buffer solution (2) being in contact with the upper end of said gel;
a second buffer solution tank (3) attached to the lower side of said gel which contains a second buffer solution (4) being in contact with an lower end of said gel;
an electric power source (5) connected between said first and second buffer solution tank so that a direct current high voltage is supplied to said gel and the upper end of said gel becomes a negative electrode;
a detector (14) attached to said first plate (7) at a determined position which detects DNA fragments migrating through said gel when the DNA fragments pass in front thereof;
a first thermostat panel (31) attached to said second plate (6) at a first region (a) near said well (9) to which water is supplied at a controlled low temperature; and
a second thermostat panel (32) attached to said second plate (6) at a second region (b) near the place where detector (14) is attached to which water is supplied at a controlled temperature higher than said low temperature.

4,892,639

ELECTROPHORESIS PLATE AND METHOD OF MAKING SAME

Robert J. Sarrine, Beaumont; Philip A. Guadagno, Vidor, and Henry A. Garsee, Kountze, all of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

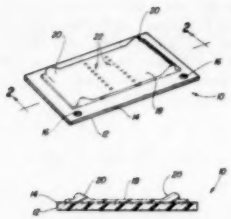
Filed Jul. 17, 1987, Ser. No. 74,584

Int. Cl.[4] G01N *27/28, 27/26*

U.S. Cl. 204—299 R **19 Claims**

1. In an electrophoresis plate of the type including a substrate which is chemically and electrically inert, relative to electrophoretic separation, and a layer of electrophoretic medium thereon, the electrophoretic medium including at least some buffer material, the electrophoretic medium including upper and lower surfaces, the lower surface of the electrophoretic medium being in contact with said substrate, the improvement comprising:
alignment means associated with the electrophoresis plate; and
buffer blocks formed integrally with the electrophoretic

medium and spatially oriented in a predetermined position relative to the alignment means, said buffer including material for functioning as a self-contained reservoir;



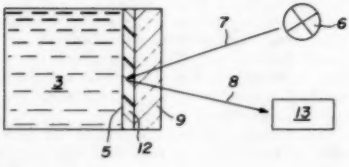
said buffer blocks extending from said upper surface of the electrophoretic medium in a direction away from said substrate.

4,892,640

SENSOR FOR THE DETERMINATION OF ELECTROLYTE CONCENTRATIONS

Otto S. Wolfbeis, Graz, Austria, and Petra Braun geb. Hochmuth, Munzbach, Luxembourg, assignors to AVL AG, Switzerland

Filed Jul. 12, 1988, Ser. No. 218,445
Claims priority, application Austria, Apr. 16, 1985, 1148/85
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—418 **14 Claims**



1. A sensor for determining the concentration of an electrolyte in an aqueous sample solution, said sensor comprising an ion-selective membrane which contains valinomycin as an ion-carrier material and which has a first side that can be brought into contact with an electrolyte-containing aqueous sample solution, and a potential-sensitive fluorescent indicator immobilized at said first side of said ion-selective membrane, said fluorescent indicator, when excited, emitting fluorescence having an intensity which is dependent on a potential difference which arises at the boundary surface between said ion-selective membrane and said electrolyte-containing aqueous sample solution due to ion transport from said sample solution into said ion-selective membrane at said boundary surface by means of said ion-carrier material, said fluorescence intensity corresponding to the concentration of electrolyte in the electrolyte-containing aqueous sample solution.

4,892,641

PROCESS FOR THE PRODUCTION OF MESOPHASE PITCH

Ta-Wei Fu, Ponca City, Okla., and Manfred Katz, Wilmington, Del., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 99,033, Sep. 21, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,600
Int. Cl.[4] C10G *27/00*; C10C *3/04, 3/02*
U.S. Cl. 208—39 **17 Claims**

1. A process for producing a pitch product having a mesophase content of from 50 to 100% by volume and a melting point below 360° C. and suitable for carbon fiber manufacture which comprises heating a molten carbonaceous feedstock substantially free of mesophase pitch in the presence of an oxidatively reactive sparging gas at a temperature of from about 200° C. to about 350° C. and for a time period sufficient to increase the oxygen content and/or molecular weight of the carbonaceous feedstock, said carbonaceous feedstock remaining substantially free of mesophase pitch after such treatment, and thereafter heating the oxidatively treated carbonaceous feedstock to a melt phase at a higher mesophase-forming temperature while passing a non-oxidative sparging gas therethrough for a time period sufficient to produce a pitch product having said mesophase content and a melting point of below 360° C.

4,892,642

PROCESS FOR THE PRODUCTION OF MESOPHASE

Hugh E. Romine, and Ta-Wei Fu, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 125,968, Nov. 27, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,536
Int. Cl.[4] C10G *27/00*; C10C *3/04, 3/02*
U.S. Cl. 208—39 **17 Claims**

1. A process for producing a pitch product having a mesophase content of from 50 percent to 100 percent by volume and suitable for carbon fiber manufacture which comprises heating a carbonaceous feedstock substantially free of mesophase pitch to a melt phase at an elevated temperature while passing through the molten feedstock, a sparging gas containing an oxidatively reactive gaseous component for a sufficient period of time to produce a substantially isotropic pitch product containing mesophase precursors and thereafter solvent fractionating said pitch product to produce a solid pitch product which on fusion has said mesophase content.

4,892,643

UPGRADING NAPHTHA IN A SINGLE RISER FLUIDIZED CATALYTIC CRACKING OPERATION EMPLOYING A CATALYST MIXTURE

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 191,716, May 2, 1988, abandoned, which is a continuation of Ser. No. 903,343, Sep. 3, 1986, abandoned. This application Apr. 11, 1989, Ser. No. 336,571
Int. Cl.[4] C10G *63/04*
U.S. Cl. 208—70 **8 Claims**

1. A fluidized catalytic cracking process undertaken in a single riser which comprises introducing a heavy feed comprising 343 C+ (650 F.) hydrocarbons and passing it up through the riser in the presence of a cracking catalyst having a settling rate in the riser, to provide lighter products including naphtha product; and deactivated cracking catalyst which is stripped in a catalyst stripper, and regenerated in a regenerator and recycled to the riser to contact more heavy feed characterized by

(a) use of an additive component which contains a shape selective crystalline silicate zeolite catalyst which has a higher settling rate than the settling rate of the cracking catalyst so as to reside in the riser for a longer period of time than the cracking catalyst component and introducing naphtha to the riser downstream of the heavy charge in the presence of the additive component to produce a gasoline product; and

(b) separating the additive from the cracking catalyst upstream of the regenerator and recycling directly to the riser the additive component without passing the additive component through the regenerator to reduce the residence time of the additive in the regenerator relative to the cracking catalyst and increase the residence time of the additive component in the riser reactor relative to the cracking catalyst.

4,892,644

UPGRADING SOLVENT EXTRACTS BY DOUBLE DECANTATION AND USE OF PSEUDO EXTRACT AS HYDROGEN DONOR

Byung Choi, Cherry Hill; Grant G. Karsner, Voorhees Township, Camden County; Chang-Kuei Lee, Sewell; Madhava Malladi, West Deptford, all of N.J., and Donald Milstein, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 13,733, Feb. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 793,938, Nov. 1, 1985, abandoned. This application Oct. 7, 1988, Ser. No. 256,095

Int. Cl.[4] C10G *47/32*

U.S. Cl. 208—107 25 Claims

1. A process for visbreaking a heavy petroleum residual oil which comprises subjecting the residual oil to an elevated temperature for a period of time corresponding to an equivalent reaction time of about 250 to about 1500 ERT seconds at 427° C., to produce a fuel oil product having a viscosity lower than that of the starting residual oil, the residual oil being subjected to the elevated temperature in the presence of from about 0.1 to about 50 weight percent, based on the residual oil, of a hydroaromatic solvent having a content of H_{alpha} hydrogen of at least about 20 percent of the total hydrogen content, said hydroaromatic solvent being provided as a pseudo extract from a solvent extraction process in which a liquid hydrocarbon feed containing aromatic and non-aromatic hydrocarbon components is extracted with an extraction solvent to provide a raffinate phase containing a major portion of the non-aromatic components and an extract phase containing the major portion of the aromatic hydrocarbon components of the feed, cooling the extract phase to separate it into a pseudo raffinate containing most of the non-aromatics of the extract phase and a pseudo extract containing most of the aromatic content of the extract phase, and separating the pseudo raffinate from the pseudo extract.

4,892,645

DEWAXING CATALYST BASED ON TIN CONTAINING MATERIALS

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,205

Int. Cl.[4] C10B *47/02, 11/02*

U.S. Cl. 208—111 29 Claims

1. A catalytic dewaxing process comprising

contacting a waxy feed, containing C_{15}° paraffins, under dewaxing conditions, with a non-acidic catalyst comprising a dehydrogenation metal and a non-acidic crystalline microporous modifier containing material wherein the modifier is selected from the group consisting of tin, thallium, and lead;

converting said C_{15}+ paraffins to distillate range boiling products; and

producing a product having a pour point which is less than that of the feed.

4,892,646

METHOD FOR TREATING DEWAXING CATALYSTS

Chaya Venkat, Princeton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 87,196, Aug. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 937,951, Dec. 4, 1986, abandoned. This application May 2, 1988, Ser. No. 189,454

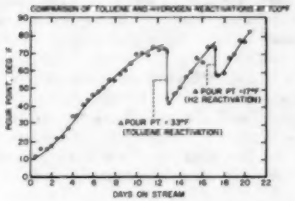
Int. Cl.[4] C10G *11/05, 47/20, 47/18;* B01J *29/38*

U.S. Cl. 208—111 4 Claims

1. A process for dewaxing a wax-containing lube stock which comprises:

dewaxing said lube stock with a fresh zeolite dewaxing catalyst, having a constraint index between 1 and 12, in an original catalyst dewaxing cycle, wherein prior to said original dewaxing cycle the fresh catalyst is pretreated in the presence of hydrogen gas with one or more low molecular weight aromatic hydrocarbon compounds selected from the group consisting of benzene, toluene, xylene, naphthalene and mixtures thereof at temperatures greater than 800° F. and under conditions which deposit on the catalyst between 2 and 30% of coke, by weight of the catalyst;

continuing said first catalytic dewaxing cycle to an end of cycle dewaxing reaction temperature of between 650° to


COMPARISON OF TOLUENE AND HYDROGEN REACTIVATIONS AT 1000°F
POUR POINT, DEG F
DAYS ON STREAM
▲ POUR PT. +17°F (H2 REACTIVATION)
▲ POUR PT. + 33°F (TOLUENE REACTIVATION)

680° F. at which point said dewaxing catalyst is substantially deactivated; and

regenerating said pretreated dewaxing catalyst by contacting the substantially deactivated catalyst with hydrogen and one or more low molecular weight aromatic hydrocarbon compounds selected from the group consisting of benzene, toluene, xylene, naphthalene or mixtures thereof at a temperature from 600° to 1200° F. to reactivate the catalyst.

4,892,647

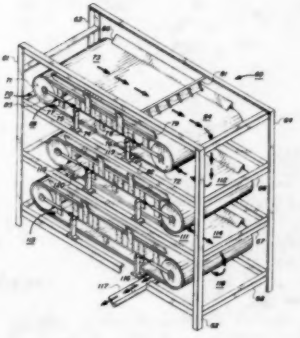
SYSTEM FOR SEGREGATING TRASH

Franklin D. Liddle, 4144 W. Gail, Chandler, Ariz. 85226, and Ottavio A. Tassielli, 1101 W. Lynwood, Phoenix, Ariz. 85007

Filed Jul. 5, 1988, Ser. No. 215,779

Int. Cl.[4] B07B *13/00*

U.S. Cl. 209—11 7 Claims



1. A system for segregating trash containing thermoplastic material and non-thermoplastic material into collectable fractions comprising a plastic segregator assemblage having a vertical frame member, a plurality of horizontal frame members mounted to said vertical frame member in spaced generally parallel relationship to each other, and a plurality of heated conveyor units, one of said heated conveyor units being mounted between and to each pair of adjacent ones of said horizontal frame members in staggered relationship to each other, each of said conveyor units having a driving roller, a driven roller disposed in rigid spaced operative relationship to said driving roller, and an endless conveyor belt reeved around

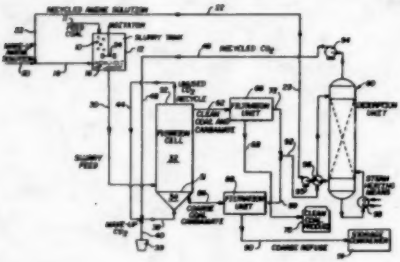
said driven roller and said driving roller said belt being operable in response to said driven roller to transport trash placed thereupon to the end of thereof to provide a continuous flow of trash therealong with gradual heating until substantially all of said thermoplastic contained therein adheres to one of said belts while non thermoplastic material pass therefrom; said heated conveyor unit having a heater unit operatively disposed between said rollers and between the upper and lower run of each said endless conveyor belt, said heater unit having a main frame an upper grid support superposed to said main frame and having a surface facing said conveyor belt and a plurality of leg members depending therefrom into supportive engagement with said main frame, a lower grid support subposed to said main frame and having a surface facing said conveyor belt and a plurality of leg members extending upwardly therefrom into supportive engagement with said main frame, a first and second heat plate, said first plate being secured to said facing surface of said upper grid support and said second plate being secured to said facing surface of said lower grid support, and means for removing said adherent thermoplastic material from each said belt.

4,892,648

PROCESS FOR BENEFICIATION OF COAL AND ASSOCIATED APPARATUS

Amol A. Kulkarni, Pittsburgh, Pa., assignor to Viking Systems International, Inc., Pittsburgh, Pa.

Filed Apr. 20, 1989, Ser. No. 340,913
Int. Cl.[4] B03D *1/02, 1/10, 1/12*
U.S. Cl. 209—164 **15 Claims**



1. A process for separating coal particles from mineral matter in a raw coal feed material containing said coal particles and said mineral matter comprising the steps of

mixing said raw coal feed material with an aqueous amine solution to create an aqueous slurry,

introducing said aqueous slurry into a lower portion of a flotation cell,

charging said lower portion of said cell with gas containing carbon dioxide so as to create bubbles,

creating turbulence in said aqueous slurry by said charging of said gas, so that said coal particles attach to said bubbles,

reducing the size of said bubbles by about 50% to 90% as said bubbles rise from said lower portion of said cell to said upper portion of said cell by operating the cell under conditions such that the carbon dioxide chemically reacts with said amine solution,

transporting said coal particles by means of said rising bubbles to an upper portion of said cell, and

removing said coal particles from said upper portion of said cell.

4,892,649

CALCIUM CARBONATE BENEFICIATION

Joseph L. Mehaffey, Lockport, and Thomas C. Newman, Hinsdale, both of Ill., assignors to Akzo America Inc., New York, N.Y.

Filed Jun. 13, 1988, Ser. No. 206,247
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—166 **2 Claims**

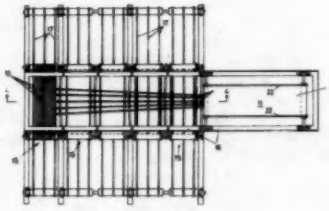
1. A process for purifying calcium carbonate ore containing silicate impurities comprising grinding and forming an aqueous slurry of said ore, adding an effective amount of a collector selective for said silicate impurities to said slurry comprising dimethyl (2-ethylhexyl) cocoammonium chloride, and subjecting said slurry containing said silicate impurity collector to froth flotation thereby floating the silicate impurities away from a resultant slurry containing purified calcium carbonate.

4,892,650

FRUIT GRADING MACHINE

Phillip J. Wotton, Carey Gully, Australia, assignor to Belt-Ton Grading Pty., Ltd., So. Australia, Australia

Filed Oct. 11, 1988, Ser. No. 255,662
Claims priority, application Australia, Oct. 13, 1987, PI4850
Int. Cl.[4] B07C *5/06*
U.S. Cl. 209—621 **10 Claims**



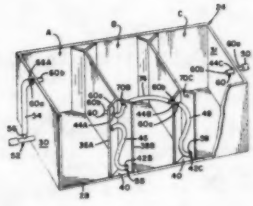
1. A fruit grader comprising a loading station, a plurality of belts of soft resilient elastomer which are driven and which diverge in a longitudinal direction away from the loading station, and a plurality of banks of closely spaced belts also of soft resilient elastomer beneath the diverging belts and which extend transversely thereof, and respective drive means for the diverging belts and the transversely extending belts.

4,892,651

FILTERING SYSTEM FOR FISH PONDS

Theodore L. Hill, 1506 Crestmont Dr., Harrisburg, Pa. 17112

Filed Mar. 25, 1988, Ser. No. 173,456
Int. Cl.[4] E04H *3/16*
U.S. Cl. 210—151 **9 Claims**



1. A filtering system for filtering the water in a man-made pond of the type containing fish, said system comprising:

means for defining a plurality of chambers with at least one of said chambers having micro-organisms for scavenging organic waste matter from the water entering said cham-

bers from the pond, said means being a single structure having end walls, side walls, a floor and including intermediate walls between and defining adjacent chambers, said intermediate walls including hollow enclosures devoid of water;

inlet means attached to and extending between said single structure and the pond for directing water from the pond to said single structure;

outlet means for directing water from said single structure to the pond;

first conduit means fluidly connecting each of said plurality of chambers, said first conduit means being disposed in each of said hollow enclosures; and

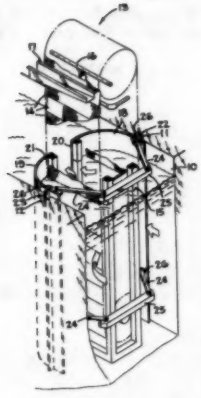
second conduit means for being selectively integrated into said first conduit means whereby the flow of water through the system may bypass at least one chamber.

4,892,652

CURVED DIVERTER PLATE ASSEMBLY FOR INTERCHANGEABILITY OF VARIOUS MODELS OF TRAVELING WATER SCREENS

Douglas W. Rudy, Naperville, Ill.; Michael P. Hunnemann, Ottsville, and Stephen B. Thomas, Silverdale, both of Pa., assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 22, 1988, Ser. No. 223,208
Int. Cl.[4] B01D *33/02*
U.S. Cl. 210—160 **3 Claims**



1. Mounting means for mounting a dual flow traveling water screen, said screen including a screen frame, in a channel having a pair of vertical walls having vertical cavities, said mounting means comprising a first curved diverter plate having an upstream edge portion, located adjacent one of the vertical walls, said first curved diverter plate attached to and extending radially outward from said screen frame of said dual flow traveling water screen to one vertical wall of said pair of vertical walls of said channel;

a second curved diverter plate having an upstream edge portion locted adjacent the other vertical wall, said second curved diverter plate attached to and extending radially outward from the screen frame to the other of said pair of channel walls;

said first and second diverter plates each having a projecting flange on the obverse sides of said curved diverter plates, said projecting flanges projecting into said vertical cavities of said walls when said traveling water screen is in said channel;

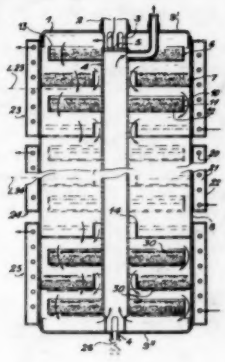
compression struts extending from said upstream edge portions of said curved diverter plates to said screen frame.

4,892,653

COLD TRAP FOR THE PURIFICATION OF LIQUID METALS CONTAINING DISSOLVED IMPURITIES

Christian Latge, Aix En Provence, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Sep. 9, 1987, Ser. No. 94,670
Claims priority, application France, Sep. 10, 1986, 86 12657
Int. Cl.[4] B01D *8/00*; **G21C** *19/00*
U.S. Cl. 210—184 **8 Claims**



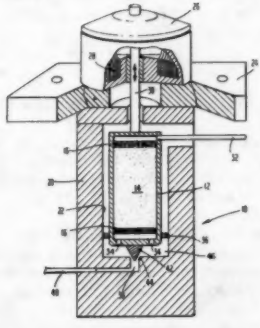
1. A liquid metal purification cold trap comprising a reservoir pipe for supplying the liquid metal to be purified and linked with the intake of the reservoir, a pipe for discharging the purified metal linked with the outlet of the reservoir, a plurality of independently operating cooling means around said reservoir, and in series along the reservoir and, in the reservoir, a plurality of filter assemblies having perforated bases lined with metal wool, the filter assemblies being arranged perpendicular to the overall direction of the outflow of the liquid metal to be purified, being spaced from one another and each defining an opening, the openings being staggered so so as to permit a staggered outflow of the liquid metal in the reservoir.

4,892,654

TRAPPING ASSEMBLY

Mark A. Nickerson, 19 Glenlock Dr., Landenberg, Pa. 19350

Filed Mar. 15, 1989, Ser. No. 324,353
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **4 Claims**



1. In a fluid trapping assembly for use with fluid systems

having a column for removing and collecting a solute component of said fluid, the combination comprising:

a fluid entrance located near the base of said column and a fluid outlet located near the top of said column,

a valve chamber surrounding the base of said column having a fluid inlet orifice for admitting fluid into said chamber,

a column seal surrounding said column and forming the upper part of said chamber, said seal being in sealing engagement with said column,

orifice engagement means attached to the base of said column adapted to engage said fluid inlet orifice and restrict the flow of fluid into said chamber and through said column,

axial movement means adapted to engage said column and move said orifice engagement means into and out of engagement with said orifice.

4,892,655

ARRANGEMENT FOR WATER TREATMENT

Leopold Makovec, Kalchgruben 39, A-6094 Axams, Austria

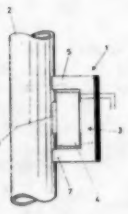
PCT No. PCT/EP87/00083, § 371 Date Oct. 16, 1987, § 102(e) Date Oct. 16, 1987, PCT Pub. No. WO87/05003, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 15, 1987, Ser. No. 116,570

Claims priority, application Austria, Feb. 21, 1986, 462/86

Int. Cl.[4] C02F *1/48*

U.S. Cl. 210—222 **10 Claims**



1. Arrangement for treatment of water by a magnetic field the arrangement comprising in combination an electromagnet and a pipe carrying water, the pipe having an external surface with a surface curvature and a longitudinal direction, the electromagnet having at least one exciter coil and being applied to the external surface of the pipe carrying water, the electromagnet having a U- or E-shaped iron core (3) with freely projecting legs (5, 6, 7), the legs being pressed against the pipe (2) consecutively in longitudinal direction of the pipe, the legs (5, 6, 7) having free ends with end surfaces facing the pipe, each end surface having a shape and means for matching said shape to the surface curvature of the pipe (2) comprising the iron core (3) being constituted by layered sheet metal plates (8) which are displaceable relative to each other in direction of the legs (5, 6, 7).

4,892,656

VACUUM FILTER WITH RELEASABLY CLAMPED SEALING STRIP

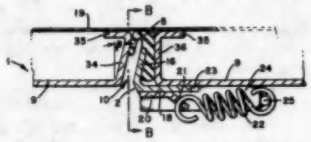
Kurt E. Pietzsch, Wiesbaden-Sonnenberg, Fed. Rep. of Germany, assignor to Dorr-Oliver Incorporated, Milford, Conn.

Filed Feb. 23, 1989, Ser. No. 314,613

Int. Cl.[4] B01D *33/26, 33/32*

U.S. Cl. 210—232 **9 Claims**

1. A vacuum filter for separating solids from liquids comprising a circulating, endless array of troughs guided over a stationary vacuum drain and having lateral edges or weirs which constitute a common horizontal filter surface on which an endless filter cloth is laid, said troughs having leading and rear edges of rimless configuration which extend along the trough bottom transversely to the direction of trough movement, each said trough having an elastic sealing strip on a leading or rear edge thereof, the sealing strip being releasably clamped fast



against the leading and/or rear edge of the trough by means of a spring-loaded, movable clamp angle member or bracket.

4,892,657

SPACER FOR GUIDING FLOWING MEDIUM

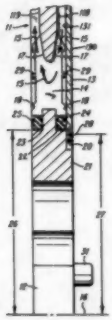
Jürgen Mohn, Reinbek, and Wilhelm Heine, Hamburg, both of Fed. Rep. of Germany, assignors to DT Membranfilter Vertriebs GmbH, Hamburg, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,280

Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715183

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—232 **18 Claims**



1. In a spacer for guiding flowing medium, constructed and arranged for use in an apparatus for filtering and separating such flowing medium via reverse osmosis and ultrafiltration, said spacer constructed and arranged for use with a respective filter element being disposed as a membrane pad having flowing medium that flows on both sides thereof in a location sandwiched between each two adjacent spacers, each said spacer having a substantially disk-like configuration with a central hole, and said spacers being constructed and arranged such that said flowing medium flows about said spacers, the improvement therewith comprising:

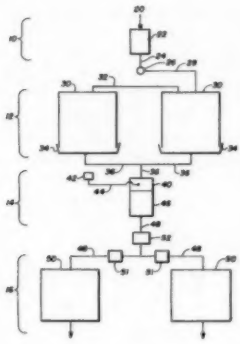
means that form a plurality of spaced-apart openings in said spacer constructed and arranged such that said flowing medium passes through said openings in a location disposed projecting about said central hole of said spacer and through which the flowing medium as a permeate drainage occurs via said membrane pad to said central hole for discharge passage thereof.

4,892,658

WASTEWATER TREATMENT SYSTEM

Joseph P. Martin, 252 Sagamore Rd., Havertown, Pa. 19083, and Kenneth J. Zitomer, 6340 N. 7th St., Philadelphia, Pa. 19126

Filed Mar. 17, 1988, Ser. No. 169,863
Int. Cl.[4] C02F 9/00
U.S. Cl. 210—617 16 Claims



13. A process for the environmentally-safe, unified treatment of a wastewater effluent, said process comprising:

primary treatment including sedimentation of a wastewater effluent to substantially remove suspended solids, providing a clarified effluent;

secondary treatment including filtration of the clarified effluent through a filtration field to oxidize organic materials and provide a nitrified effluent;

capture and conveyance of the nitrified effluent to a batch type advanced treatment zone wherein the nitrified effluent is accumulated and dosed with a controlled carbon source and held in an anoxic condition to provide a de-nitrified effluent; and

filtration of the de-nitrified effluent through an infiltration field to provide a treated effluent and discharge of the treated effluent.

4,892,659

SEPARATION AGENT COMPRISING ALIPHATIC ESTER OF POLYSACCHARIDE

Tohru Shibata; Hajime Namikoshi, and Ichiro Okamoto, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 18,814, Feb. 18, 1987, Pat. No. 4,786,415, which is a continuation of Ser. No. 716,790, Mar. 27, 1985, abandoned. This application Jul. 27, 1988, Ser. No. 225,066
Claims priority, application Japan, Apr. 2, 1984, 59-65323
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.
Int. Cl.[4] B01D 15/08
U.S. Cl. 210—635 9 Claims

6. A method for chromatographically separating an optical isomer from a racemic mixture thereof which comprises contacting said mixture, under liquid chromatographic separation conditions, with a chromatographic separation material consisting essentially of inorganic carrier particles having a particle size of from 1 μm to 10 mm and coated with from 1 to 100% by weight of resolving agent, based on the weight of said carrier particles, said resolving agent consisting essentially of amylose triacetate.

4,892,660

PRESSURE INDUCED SURFACTANT RECOVERY DURING ULTRAFILTRATION OF WATER-OIL EMULSIONS

James R. Sweet, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 17, 1988, Ser. No. 258,344
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—637 4 Claims

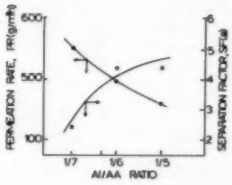
1. A method for recovering surfactant from an oil/water/-surfactant emulsion, the method consisting of contacting the emulsion with an ultrafiltration membrane having a molecular weight cut-off in the range 30,000 to 500,000 at a pressure in the range 50 to 150 psi thereby selectively permeating the surfactant through the membrane.

4,892,661

NOVEL MEMBRANE METHOD

Robert Y. M. Huang, Waterloo, Canada, assignor to University of Waterloo, Waterloo, Canada

Filed May 5, 1988, Ser. No. 190,682
Int. Cl.[4] B01L 13/00
U.S. Cl. 210—640 11 Claims



1. A novel dense non-porous pervaporation membrane material, prepared by a method which comprises:

solution blending a mixture consisting of polyvinyl alcohol in aqueous solution, polyacrylic acid in aqueous solution and a nylon in formic acid to form a homogeneous blend having a single glass transition temperature,

casting said blend into a membrane, and

ionically cross-linking the membrane to provide a dense non-porous membrane material suitable for effecting pervaporation.

10. In a pervaporation process, wherein miscible organic solvent-water solutions are selectively separated into their component parts by pervaporation using a dense non-porous membrane, the improvement which comprises using a membrane as defined in claim 1 as said membrane.

4,892,662

MEMBRANE PROCESSING METHOD

James W. Walsh, 3832 Beech Ave., Baltimore, Md. 21211

Division of Ser. No. 942,054, Dec. 15, 1986, which is a continuation-in-part of Ser. No. 694,773, Jan. 25, 1985, abandoned. This application Nov. 3, 1988, Ser. No. 266,831
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—649 11 Claims

6. An improved method of eluting molecules and molecule fragments in a gel matrix onto a membrance and treating the membrane with a fluid, comprising the steps of:

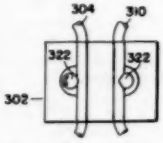
engaging a membrane onto which molecules or molecule fragments are to be eluted on at least one side with a porous membrane support material that defines a plurality of pathways across the engaged surface of the membrane;

applying the membrane and membrane support to a gel matrix from which molecules and molecule fragments are to be eluted, the membrane support positioned intermediate the gel matrix and the membrane;

establishing a capillary transfer through the gel matrix, the

membrane support, and the membrane to elute molecules and molecule fragments from the gel matrix, through the membrane support to the membrane; and

containing the membrane and the membrane support within a flexible walled container having fluid distribution channels on at least two edges of the membrane and a fluid port in communication with each of the fluid distribution channels;



introducing a fluid into one of the fluid ports for distribution into the associated fluid distribution channel; and

establishing a pressure differential between the interior and the exterior of the container to cause the flexible walls of the container to press against the membrane support to maintain engagement of the membrane support with the membrane thereby allowing the introduced fluid to flow across the surface of the membrane through the plurality of pathways to the other port.

4,892,663

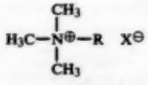
COAL FILTRATION PROCESS AND DEWATERING AIDS THEREFOR

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

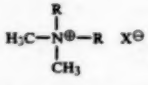
Filed Dec. 2, 1988, Ser. No. 279,423
Int. Cl.[4] B01D *37/02*
U.S. Cl. 210—729 **3 Claims**

1. In a method for dewatering an aqueous slurry of solid coal particulates wherein the aqueous slurry contains between about 10 and 60 percent of solid coal particulates and a dewatering aid is added to said slurry followed by vacuum filtration thereof to produce a filter cake of said coal particulates, the improvement for lowering the water content of said filter cake which comprises adding to said slurry prior to filtration an effective amount of a dewatering aid selected from the group consisting of:

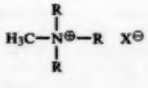
(a) a monoalkyl trimethyl quaternary ammonium compound of the structure:



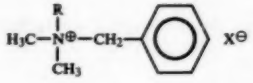
(b) a dialkyl dimethyl quaternary ammonium compound of the structure:



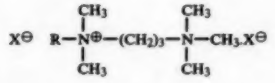
(c) a monomethyl trialkyl quaternary ammonium compound of the structure:



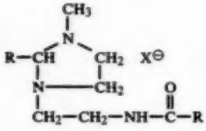
(d) a dimethyl alkyl benzyl quaternary ammonium compound of the structure:



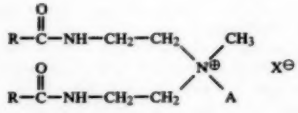
(e) a diquaternary ammonium compound of the structure:



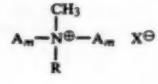
(f) an imidazolinium quaternary ammonium compound of the structure:



(g) a diamido monohydroxyalkyl quaternary ammonium compound of the structure:



(h) a monomethyl di(hydroxyalkyl) quaternary ammonium compound of the structure:



where:

each R independently is a C_8–C_{22} alkyl group,

A is a 2-hydroxyethyl or 2-hydroxypropyl group;

$X^{\ominus}$ is the anionic residue of an alkylating agent, and m is 1–50,

and mixtures thereof.

4,892,664

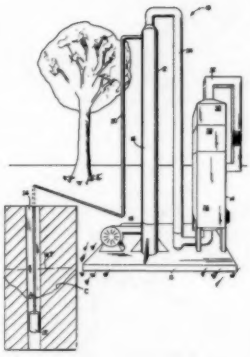
DECONTAMINATION OF SITES WHERE ORGANIC COMPOUND CONTAMINANTS ENDANGER THE WATER SUPPLY

Paul C. Miller, Pitman, N.J., assignor to Groundwater Technology, Inc., Norwood, Mass.

Filed Jul. 28, 1987, Ser. No. 78,779
Int. Cl.[4] C02F *1/20*
U.S. Cl. 210—747 **10 Claims**

1. A decontamination system installed at an outdoor contaminated site at which organic contaminants have entered the ground and contaminate the ground water, said system comprising air stripper means constructed to receive water from said outdoor site containing said organic contaminants and constructed to produce therefrom an air stream carrying organic contaminants and an effluent water stream substantially free of said organic contaminants, and decontamination apparatus having an inlet to receive said air stream carrying site-

derived organic contaminants, preheating means, comprising (a) a heat exchanger and (b) a heater arranged to preheat said air stream, an oxidizing catalytic converter having a predetermined minimum operating temperature for efficient operation and arranged to receive the preheated air stream from said preheater means and constructed to oxidize said site-derived organic contaminants carried by said air stream to produce an effluent air stream substantially free of said organic contaminants, and ducting directing the effluent air stream from said catalytic converter through said heat exchanger, and thence to



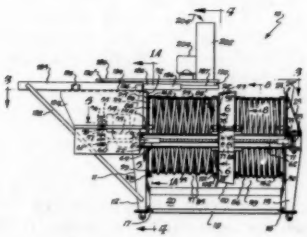
the atmosphere, said heat exchanger effective to cause the air stream, flowing from said catalytic converter, to transfer its heat to the incoming air stream that carries site-derived contaminants, said heater of said preheating means constructed and arranged to cooperate with said heat exchanger to elevate the temperature of said preheated air stream reaching said catalytic converter to said minimum operating temperature, whereby a gaseous effluent substantially free of said site-derived organic contaminants is released to the atmosphere at said outdoor site while an effluent stream of water decontaminated of said site-derived organic contaminants is produced.

4,892,665

METHOD AND PRESS FOR PRESSING LIQUID FROM THIN LAYERS OF LIQUID CONTAINING MASSES

Dale E. Wettlaufer, 7930 Clinton St., Elma, N.Y. 14059

Filed Dec. 5, 1983, Ser. No. 558,181
Int. Cl.[4] B01D *25/12, 29/12*
U.S. Cl. 210—770 **28 Claims**



1. A press for pressing liquid from a liquid-containing mass comprising a press frame, spaced horizontal frame members on said press frame, first and second vertical stationary platens spacedly mounted on said horizontal frame members, a horizontally movable vertical platen mounted on said horizontal frame members and having a first side facing said first stationary platen and a second side facing said second stationary platen, a plurality of first horizontally spaced vertical racks, first mounting means mounting said first vertical racks between said first fixed platen and said first side of said movable platen, a plurality of second horizontally spaced vertical racks, second mounting means mounting said second racks between said second fixed platen and said second side of said movable platen, a plurality of first porous bags having first openings at their upper ends, third mounting means mounting said first porous bags between said first racks, a plurality of second porous bags having second openings at their upper ends, fourth mounting means mounting said second porous bags between said second racks, and linkage means for moving said movable platen toward and away from said first and second fixed platens whereby liquid-containing masses in said first or second bags may be pressed while the solids remaining after pressing in the other of said first or second bags may be removed and additional liquid-containing masses may be placed into said other of said first or second bags.

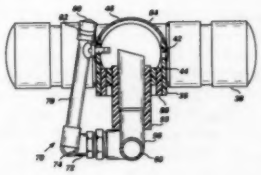
6. A method of pressing liquid from liquid-containing masses comprising the steps of mounting a plurality of relatively thin porous bags in interspersed relationship with racks on a frame, said bags having openings at their tops facing upwardly, filling liquid-containing masses into said plurality of relatively thin porous bags through said openings, applying a pressing force to each of said plurality of relatively thin bags through said racks to press liquid from said liquid-containing masses therein, relieving said pressing force from said bags, and inverting as a unit said frame and said racks and said bags to discharge from the openings of said bags the residue of said liquid-containing masses.

4,892,666

SKIMMING APPARATUS AND METHOD

Douglas A. Paulson, 10931 Rainier Ave. S., Seattle, Wash. 98178

Filed Oct. 7, 1988, Ser. No. 255,066
Int. Cl.[4] C02F *1/40*
U.S. Cl. 210—776 **29 Claims**



28. An improved method for removing a fluid from an immiscible fluid composition including a floating liquid and a carrying liquid, said method comprising the steps of:

(a) disposing, in a fluid composition of immiscible liquids, a body having an internal cavity and allowing a fluid composition comprised substantially of said floating liquid to enter said internal cavity;

(b) supporting said body with flotation means in said fluid composition;

(c) skimming said floating liquid from the fluid within said internal cavity with a slidable pickup conduit disposed coaxially with a receiving conduit coextensive with the bottom of said cavity; and

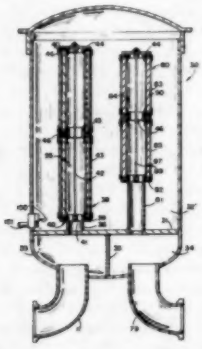
(d) removing said skimmed floating liquid from said internal cavity with means which permit rotation of said body about a horizontal plane while permitting free movement in a vertical plane.

4,892,667

METHOD AND MEANS FOR DEWATERING LUBRICATING OILS

Matt Parker, III; Michael D. Blom, and Roger K. Miller, all of LaGrange, Ga., assignors to Kaydon Corporation, Muskegon, Mich.

Filed Sep. 16, 1988, Ser. No. 245,045
Int. Cl.[4] B01D *17/02, 29/26*
U.S. Cl. 210—799 **12 Claims**



1. In the process of removing water by coalescence from lubricating oil having a viscosity at 65° F. of approximately 350 ssu which water has formed an emulsion with the oil and maintaining a flow rate of at least 100 gallons per hour per square foot of coalescer surface when the oil has a viscosity of 150 ssu or less, the steps which include passing the oil through a particulate filter element in a preconditioning unit, passing the oil containing free water and the oil/water emulsion into the internal central chamber of a coalescer; in the coalescer passing the oil through a first member of pleated filter medium surrounding said chamber to initiate breaking of the emulsion, supporting the member externally against outwardly acting pressure exerted by the oil and surrounding the pleats with spaced rings and anchoring the rings to the apices of said pleats to support the rings and members against outwardly acting radial thrust, passing the liquid discharged from the first member through plural layers of compressed glass fiber in mat form to further coalesce the separated water, passing the coalesced water droplets through a non-wettable screen into a non-compressed layer of glass fibers and then through a closely woven jacket of non-wettable fabric to form droplets of water of sufficient size that they will separate from the jacket and descend through the surrounding body of oil to collect at the bottom of the vessel in which the coalescer is housed.

4,892,668

BLOOD COLLECTION BAG SUPPORT

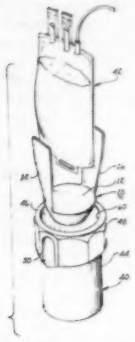
Daniel C. Harmony, Tucson, Ariz., and Bradley T. Noble, Redondo Beach, Calif., assignors to Engineering & Research Associates, Inc., Tucson, Ariz.

Filed Oct. 5, 1988, Ser. No. 253,687
Int. Cl.[4] B01D *21/26;* **B04B** *15/00*
U.S. Cl. 210—782 **16 Claims**

13. A method for preventing isolation of a quantity of blood within one or more folds of a blood collection bag during centrifugaiton after placement of the blood collection bag within a centrifuge cup, said method comprising the steps of:

(a) generating a source of fluid under pressure during the centrifugation process; and

(b) imposing a force upon a side of the blood collection bag in response to said step of generating to pressurize the interior of the blood collection bag and urge unfolding of any folds of the blood collection bag to permit drainage



therefrom of any contained blood in response to the centrifugal forces imposed.

4,892,669

COMPOSITION BASED ON POLYTETRAFLUOROETHYLENE SUITED FOR OBTAINING A SELF-LUBRICATING LAYER ON POROUS BRONZE BEARINGS

Giovanni Marcora, Magnago, and Federico Cataldo, Cagliate, both of Italy, assignors to Ausimont S.p.A., Italy

Filed Nov. 16, 1987, Ser. No. 120,663
Claims priority, application Italy, Nov. 21, 1986, 22419 A/86
Int. Cl.[4] C10M *107/38, 125/00*
U.S. Cl. 252—30 **5 Claims**

1. A PTFE-based composition suited for forming a covering layer with self-lubricating properties, to be applied on a porous bronze substrate, formed following a thermal sintering treatment, characterized in that it consists of the following ingredients, indicated in parts-by-weight per 100 parts of mixture:

(a) PTFE in the form of a dry powder, with a granulometric distribution of between 1μ and 8μ, a molecular weight from 300,000 to 500,000 and a melt-flow index of 0.1–0.3, measured at 350° C. according to ASTM D-1238, in a quantity between 30 to 60 parts by weight (p.b.w.);

(b) inorganic component selected from: MoS_2, PbO, powdery metal Pb-graphite and aluminum silicates with a granulometry of from 4 to 5 microns, in a quantity of between 10–25 parts by weight;

(c) an adhesive resin, selected from epoxy-, silicon-, and polyamidic resins, in a quantity between 2 and 8 p.b.w.;

(d) a chlorinated hydrocarbon solvent with a good wetting power for PTFE and the inorganic component having a boiling point between 50° and 150° C., in a quantity between 10 and 20 p.b.w.;

(e) alliphatic paraffinic hydrocarbon having a viscosity between 10 and 20 centistokes at 40° C. in a quantity between 10 and 50 p.b.w.;

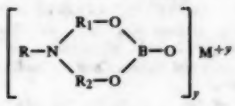
4,892,670

LUBRICATING COMPOSITIONS

Leah T. Mendelson, Santa Ana, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 29, 1985, Ser. No. 695,958
Int. Cl.[4] C10M *141/02*
U.S. Cl. 252—37 **53 Claims**

1. A lubrication composition comprising a lubricating oil containing an antiwear enhancing amount of a dissolved copper carboxylate and a boron-containing compound of the formula



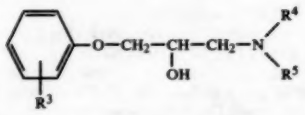
wherein:
y is an integer;
M is a inorganic or organic radical;
R is a C_1 to C_{50} organic radical; and
R_1 and R_2 are the same or different C_1 to C_{50} organic radical.

4,892,671
2-PROPANOL DERIVATIVES AS CORROSION INHIBITORS

Robert M. O'Neil, Flixton, and John D. Payne, Withington, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 63,884, Jun. 19, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,769
Claims priority, application United Kingdom, Jun. 28, 1986, 8615866; Dec. 13, 1986, 8629834
Int. Cl.[4] C10M *133/14*; C07C *93/06*
U.S. Cl. 252—51.5 R **11 Claims**

1. A composition consisting essentially of a lubricant in contact with ferrous metal and a corrosion inhibiting amount of at least one compound of formula (I).



(I)

or a derivative thereof in which R^3 is hydrogen, a C_3–C_{15} straight or branched chain alkyl residue, a C_5–C_{12} cycloalkyl residue, a C_6–C_{15} aryl residue or C_7–C_{12} aralkyl residue, and R^4 and R^5 are, independently, hydrogen, 2-hydroxyethyl or 2-hydroxypropyl with the provisos that

(a) R^4 and R^5 are not simultaneously hydrogen;
(b) when R^4 and R^5 are each $—CH_2—CH_2—OH$, R^3 is not a pentyl residue;
(c) that polyalkylene phenol or polycarboxylic ester co-additives are absent; and
(d) when R^3 is C_3–C_{15} alkyl, R^4 and R^5 are not hydrogen; as well as salts thereof.

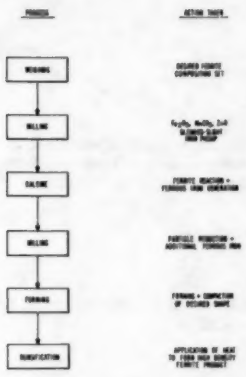
4,892,672
PROCESS FOR CONTROLLING FERROUS IRON CONTENT IN MANGANESE ZINC FERRITE

Ralph W. Scheidecker, and Robert R. Suchomel, both of Byron, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 566,872, Dec. 29, 1983, abandoned. This application Aug. 1, 1985, Ser. No. 761,534
Int. Cl.[4] C04B *35/26*
U.S. Cl. 252—62.51 **10 Claims**

1. Process of preparing a ferrite composition with a final ferrous iron content of about 1.5% from ferrite material in a mixture with ranges of 52–55 mole percent Fe_2O_3, 26–32 mole percent MnO and 15–20 (22) mole percent ZnO, the process comprising the steps of:

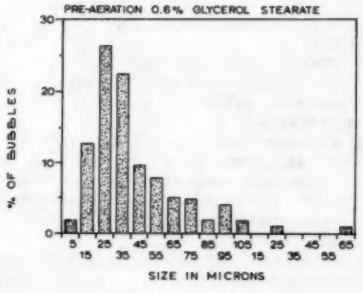
a. weighing powders for setting a desired final ferrite powder composition;
b. first milling said ferrite powder composition in a stainless steel mill with stainless steel media for intimate mixing of said ferrite powder composition and controlled iron pick-up;
c. calcining said ferrite powder composition for a first time interval under a flowing inert atmosphere providing for formation of ferrite spinal structures in a ferrite reaction of ferric iron to ferrous iron reduction; and,
d. second ball milling said calcined ferrite powder composition in a stainless steel mill with stainless steel media for a second time interval providing particle reduction and additional ferrous iron pick-up yielding an optimum final ferrous iron content of about 1.5% in said final ferrite powder composition.



4,892,673
NON-AQUEOUS, NONIONIC HEAVY DUTY LAUNDRY DETERGENT WITH IMPROVED STABILITY

Nagaraj S. Dixit, Kendall Park; Robert J. Rhinesmith, Somerset; James J. Sullivan, New Brunswick; Cynthia A. Barone, Colts Neck; Richard P. Adams, Kendall Park, and Kuo-Yann Lai, Plainsboro, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 2, 1988, Ser. No. 188,947
Int. Cl.[4] C11D *17/00*
U.S. Cl. 252—114 **61 Claims**

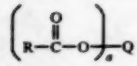


1. A non-aqueous liquid fabric treating composition comprising:

a continuous non-aqueous liquid phase comprising a detersively effective amount of at least one non-ionic surfactant;
a suspended particle phase comprising:
a detergent building effective amount of at least one particulate detergent builder salt suspended in said nonaqueous liquid phase, and
gas bubbles, having an average size of from about 10 to

about 100 microns, suspended in said non-aqueous liquid phase in an amount effective to substantially inhibit settling of said suspended particles; and

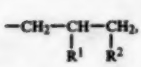
an air bubble stabilizing effective amount of a stabilizer having the formula



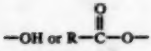
wherein

R is a hydrocarbon group of about 5 to 21 carbon atoms,

Q is a hydrogen atom, a Group IA metal, a Group IIA metal, a group having the formula



or a mixture thereof, wherein R^1 and R^2 are, independently, —OH or



(R being as defined above), and

a is 1 or 2, with the proviso that a=2 only when Q is a Group IIA metal.

4,892,674

ADDITION OF SEVERELY-HINDERED AMINE SALTS AND/OR AMINOACIDS TO NON-HINDERED AMINE SOLUTIONS FOR THE ABSORPTION OF H_2S

W. S. Winston Ho, and Guido Sartori, both of Annandale, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 13, 1987, Ser. No. 106,805

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—189 **13 Claims**

1. An absorbent composition comprising:

(1) MDEA and, optionally, at least one other non-hindered amino compound, and

(2) an additive of

(a) a severely hindered aminoacid having a cumulative $-E_s$ value greater than 1.75, said aminoacid and non-hindered amino compound being present in said absorbent composition in a mole ratio of said aminoacid to said non-hindered hindered amino compound of about 0.01:1 to 4:1,

(b) an amine salt, said amine salt being the reaction product of an amine selected from the group consisting of severely hindered amino compounds having a cumulative $-E_s$ value greater than 1.75, and a component selected from the group consisting of an acid having at least one pKa of not more than about 7, a decomposable salt of an acid having at least one pKa of not more than about 7, a compound capable of forming an acid having a pKa of not more than about 7 and mixtures thereof, said amine salt and said non-hindered amino compound being present in said absorbent composition in a mole ratio of said amine salt to said non-hindered amino compound of about 0.2:1 to 4:1.

4,892,675

OPTICALLY ACTIVE POLYMER AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Hiroyuki Nohira, Urawa; Kazutaka Arai, Yotsukaidou, and Kazuo Yoshinaga, Machida, all of Japan, assignors to Canon Kabushiki Kaisha and Nissan Chemical Industries, Ltd., both of Tokyo, Japan

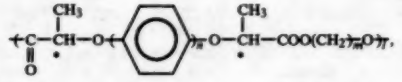
Filed Jun. 7, 1988, Ser. No. 203,132

Claims priority, application Japan, Jun. 10, 1987, 62-143177; May 17, 1988, 63-118330

Int. Cl.[4] C09K *19/52, 19/12;* C08G *63/02*

U.S. Cl. 252—299.01 **12 Claims**

1. An optically active polymer comprising recurring units of the following formula (I):



wherein l is an integer of 5–1000, n is an integer of 1–3, m is an integer of 2–20, and * denotes the location of an asymmetric center.

4,892,676

PHENYL PYRIMIDINE COMPOUND AND LIQUID CRYSTALLINE COMPOSITION

Takao Sakurai; Tadahiko Yokota; Eri Komatsu; Naoko Mikami; Ryoichi Higuchi, and Koji Takeuchi, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

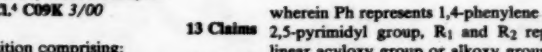
Filed Sep. 8, 1987, Ser. No. 94,290

Claims priority, application Japan, Sep. 9, 1986, 61-211894; Jan. 9, 1987, 62-3048

Int. Cl.[4] G02F *1/13;* C09K *19/34;* C07D *239/02*

U.S. Cl. 252—299.61 **11 Claims**

1. A smectic C liquid crystal compound represented by the following formula (I)



(I)

wherein Ph represents 1,4-phenylene group and Py represents 2,5-pyrimidyl group, R_1 and R_2 represent independently a linear acyloxy group or alkoxy group, either R_1 or R_2 represents a linear acyloxy group or linear alkoxy group having more than the seven carbon atoms.

4,892,677

DEFROST INDICATOR

Anthony F. Preziosi, Ledgewood; Thaddeus Prusik, Roosevelt, and Ray H. Baughman, Morris Plains, all of N.J., assignors to LifeLines technology, Inc., Morris Plains, N.J.

Division of Ser. No. 373,955, May 3, 1982. This application Dec. 19, 1984, Ser. No. 683,443

Int. Cl.[4] G01N *31/00;* G01D *21/00*

U.S. Cl. 252—408.1 **8 Claims**

1. Article of manufacture comprising an intimate mixture of a phase of crystalline diacetylenic monomer admixed with a solid solvent phase, said monomer being soluble in said solvent above the melting point of said solid solvent phase.

4,892,678

THIOPHENE DERIVATIVE POLYMER AND A POLYMER COMPOSITION THEREOF

Susumu Tanaka; Masaaki Sato, both of Tsukuba; Kyoji Kaeriyama, Tsuchiura; Yoshio Suda, Hachioji, and Takao Hiraide, Tochigi, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Division of Ser. No. 155,274, Feb. 12, 1988. This application Feb. 6, 1989, Ser. No. 306,581

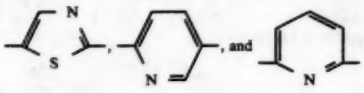
Claims priority, application Japan, Feb. 19, 1987, 62-36816

Int. Cl.[4] H01B *1/00, 1/06*

U.S. Cl. 252—500 **4 Claims**

1. A thiophene derivative polymer composition, comprising: a polymer having repeating units of the formula:

wherein n denotes a number within the range of about 10 to 500 and R represents a member selected from the group consisting of



doped with at least one anion selected from the group consisting of the tetrafluoroborate ion, perchlorate ion, hexafluorophosphate ion, hexafluoroarsenate ion, iodide, bromide, chloride, fluoride, sulfate, hydrogen sulfate, trifluoroacetate and p-toluenesulfonate in an amount within the range of 10 to 50% by weight.

4,892,679

OXA-ALKANE POLYPHOSPHONIC ACIDS, THEIR USE AS THRESHOLDERS, AND COMPLEXING COMPOSITIONS CONTAINING THESE COMPOUNDS

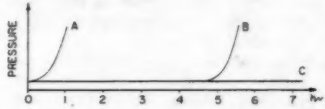
Helmut Blum, Duesseldorf, and Siglinde Hemmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 314,531

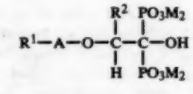
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805663

Int. Cl.[4] C07F *9/38;* **A61K** *7/16, 31/08;* **C02F** *1/00*

U.S. Cl. 562—21 **7 Claims**



1. An axo-alkane polyphosphonic acid or basic addition salt thereof of the formula:

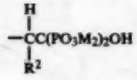


(I)

in which

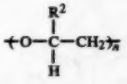
R^1 is a straight or branched chain C_1–C_{10} alkyl group, an unsubstituted or substituted C_6–C_{10} aryl group, a phenylalkyl or napthylalkyl group, a group having the formula

or a group having the formula



R^2 is H or methyl,

A is the structural unit



where n is an integer of from 1 to 20, and

M is H or the monovalent cation of a base.

4,892,680

SYNTHETIC LUBRICATING OILS AND SPECIFIED NAPHTHALENE DERIVATIVES FOR USE THEREIN

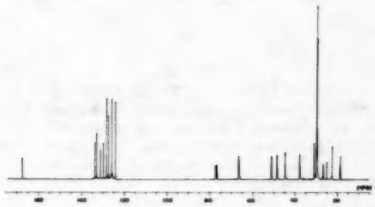
Noboru Ishida, Kawasaki, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1989, Ser. No. 294,374

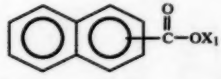
Claims priority, application Japan, Jan. 11, 1988, 63-2545; Feb. 8, 1988, 63-25742

Int. Cl.[4] C10M *105/34*

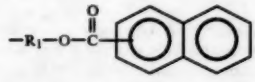
U.S. Cl. 252—565 **9 Claims**



1. A synthetic lubricating oil comprising as the main component a naphthoic acid ester represented by the general formula

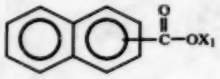


wherein X_1 is an alkyl group having 1–20 carbon atoms, or a group having the general formula

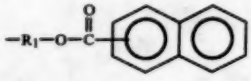


in which R_1 is an alkylene group having 2–20 carbon atoms.

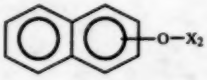
6. A synthetic lubricating oil comprising as the main components (1) a naphthoic acid ester of formula



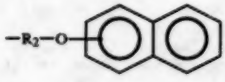
wherein X_1 is alkyl having 1–20 carbon atoms, or a group having the formula



in which R_1 is alkylene having 2–20 carbon atoms and (2) a naphthyl ether of formula



wherein X_2 is alkyl having 1–20 carbon atoms, phenyl, monoalkylphenyl having 7–26 carbon atoms or a group of formula



in which R_2 is alkylene of 2–20 carbon atoms.

4,892,681

NON-LINEAR OPTICAL ARTICLE

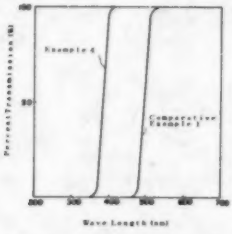
Seizo Miyata, Hoya; Toshiyuki Watanabe, Kurume; Yoshitaka Goto, and Masaharu Nakayama, both of Ibaraki, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,193

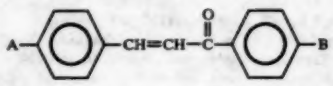
Claims priority, application Japan, Sep. 30, 1986, 61-229612

Int. Cl.[4] G02B 5/00, 6/14

U.S. Cl. 252—582 **2 Claims**



1. In a non-linear optical device in which an organic compound is disposed in a light beam, the improvement in which the organic compound is a derivative of benzalacetophenone selected from the group represented by the following general formula



wherein A is CH_3O— in case of B being —NH_2, —Br or —H; A is $(CH_3)_2N$—, Br— or C_2H_5O— in case of B being —OCH_3; and A is Br— in case of B being —H.

4,892,682

AZOMETHINE COMPOSITIONS HAVING NONLINEAR OPTICAL PROPERTIES

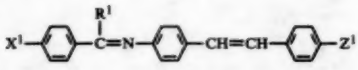
Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence, and James B. Stamatoff, Westfield, all of N.J., assignors to Hoechst Celanese Corporation, Sommerville, N.J.

Division of Ser. No. 927,990, Nov. 7, 1986. This application Mar. 20, 1989, Ser. No. 326,115

Int. Cl.[4] G02B 5/22

U.S. Cl. 252—589 **4 Claims**

1. A nonlinear optical medium in the form of a transparent solid which is a blend of constituents comprising (1) a host thermoplastic polymer; and (2) a guest organic compound corresponding to the formula:



where X^1 is —NR^2R^2, —OR^2 or —SR^2; R^1 is hydrogen or methyl; R^2 is hydrogen or a C_1–C_{20} alkyl group; and Z^1 is —NO_2, —CN or —CF_3.

4,892,683

FLAME RETARDANT LOW SMOKE POLY(VINYL CHLORIDE) THERMOPLASTIC COMPOSITIONS

Homaira Naseem, Leominster, Mass., assignor to Gary Chemical Corporation, Leominster, Mass.

Filed May 20, 1988, Ser. No. 196,326

Int. Cl.[4] C09K 21/00; H01B 7/00; C08K 9/00; C08L 27/00

U.S. Cl. 252—609 **15 Claims**

1. A flame retardant smoke-suppressed thermoplastic composition comprising the below-listed materials, amounts being expressed as parts per hundred of the sum of poly(vinyl chloride) and chlorinated polyethylene resins in the composition:

poly(vinyl chloride), in an amount from about 60 to about 90 parts per hundred of resin;

chlorinated polyethylene, in an amount from about 40 to about 10 parts per hundred of resin;

tribasic lead sulfate, in an amount from about 6 to about 12 parts per hundred of resin;

a zinc molybdate, in an amount from about 10 to about 30 parts per hundred of resin;

alumina trihydrate, in an amount from about 10 to about 30 parts per hundred of resin;

a brominated aromatic ester plasticizer, in an amount from about 10 to about 30 parts per hundred of resin;

at least one additional plasticizer besides said brominated aromatic ester, said at least one additional plasticizer being efficacious in PVC-based plastic materials; and

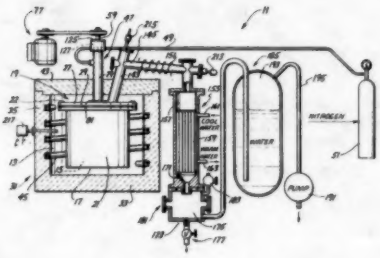
at least one lubricant efficacious in PVC-based plastic materials.

4,892,684

METHOD AND APPARATUS FOR SEPARATING RADIONUCLIDES FROM NON-RADIONUCLIDES

Richard J. Harp, 18746 Viking Way, Cerritos, Calif. 90701

Filed Nov. 12, 1986, Ser. No. 929,717
Int. Cl.[4] G21F 9/00
U.S. Cl. 252—626 29 Claims



1. Apparatus for separating radionuclides from non-radionuclides comprising:

a reactor vessel including wall members defining a reactor chamber adapted to receive a mixture of the radionuclides and non-radionuclides in a solid or liquid phase;

the radionuclides having temperatures of vaporization higher than a first temperature;

the non-radionuclides having temperatures of vaporization lower than a second temperature;

means for heating the mixture in the chamber to a temperature greater than the second temperature but less than the first temperature to drive the non-radionuclides to a vapor phase while retaining the radionuclides in a solid or liquid phase;

means for removing the vapors of the non-radionuclides from the chamber; whereby

substantially all of the non-radionuclides exit the chamber in a vapor phase while the radionuclides remain within the chamber in a solid or liquid phase.

6. A method for disposing of radionuclides present in a mixture of non-radionuclides and radionuclides, comprising the steps of:

providing a reactor apparatus including a reactor vessel having wall members defining a reactor chamber;

depositing the mixture of radionuclides and non-radionuclides in the chamber of the reactor vessel, both the radionuclides and the non-radionuclides being in the liquid or solid phase;

transforming the non-radionuclides to a vapor phase while retaining the radionuclides in a solid or liquid phase, within the chamber;

removing the non-radionuclides in the vapor phase from the chamber of the vessel while retaining the radionuclides in the solid or liquid phase within the chamber of the vessel;

separating the reactor vessel from at least a portion of the remainder of the reactor apparatus; and

burying the reactor vessel with the radionuclides disposed within the chamber of the reactor vessel.

4,892,685

PROCESS FOR THE IMMOBILIZATION OF ION EXCHANGE RESINS ORIGINATING FROM RADIOACTIVE PRODUCT REPROCESSING PLANTS

Guy Magnin; Marie-Francoise Champeaud, both of Plaisir; Véronique Aubert, Les Clayes-sous-Bois, and Claude Jaouen, Guyancourt, all of France, assignors to Societe Generale Pour Les Techniques Nouvelles S.G.N., France

Filed Feb. 16, 1988, Ser. No. 157,038
Claims priority, application France, Dec. 16, 1987, 87 17595
Int. Cl.[4] G21F 9/16
U.S. Cl. 252—628 5 Claims

1. A process for the immobilization of ion exchange resins originating from radioactive product reprocessing plants, wherein said resins are immobilized in a cement and wherein, before immobilization in the said cement, said resins are treated with an aqueous solution containing NO_3^- and Na^+ ions, the quantity of NO_3^- ions in the said aqueous solution being calculated so as to ensure that all the sites in the resins are saturated, and that the quantity of Na^+ ions used in the said aqueous solution ensures that the medium has a basic pH and that all the sites in the cationic resins are saturated.

4,892,686

PROCESS FOR THE PREPARATION OF 1-NITROANTHRAQUINONE

Walter Fischer, Reinach, and Tibor Somlo, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 22, 1988, Ser. No. 275,238
Claims priority, application Switzerland, Dec. 3, 1987, 4722/87
Int. Cl.[4] C07C 50/18
U.S. Cl. 552—253 27 Claims

1. A process for the preparation of 1-nitroanthraquinone by (1) reacting 5-nitro-1,4-naphthoquinone with butadiene, (2) oxidising the 1-nitro-5,8,11,12-tetrahydroanthraquinone so obtained to 1-nitroanthraquinone, and (3) isolating the 1-nitroanthraquinone, which process comprises reacting in step (2) 1-nitro-5,8,11,12-tetrahydroanthraquinone (a) with oxygen, as inorganic peroxide compound or a metal oxide as oxidising agent and isolating 1-nitro-5,8-dihydroanthraquinone, and then (b) oxidising this intermediate to 1-nitroanthraquinone with one of the above oxidising agents.

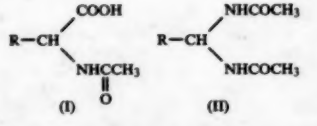
4,892,687

PROCESS FOR SYNTHESIS OF AMIDOACIDS USING A COBALT CATALYST AND A BIDENTAL PHOSPHINE LIGAND

Jiang-Jen Lin, Round Rock, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 8, 1986, Ser. No. 916,770
Int. Cl.[4] C07C 102/00, 102/06, 103/44, 103/48, 103/50
U.S. Cl. 260—404 12 Claims

1. A process for producing novel N-acetyl-amino acid derivatives represented by the formula (I) and (II) [, for example,]



which comprises reacting a feedstock from the group consisting of alpha olefins with 2 to 20 carbons and internal olefins with 4 to 20 carbons, acetamide and synthesis gas with a catalyst comprising a cobalt-containing compound promoted by a bidental-phosphine ligand in a solvent at a pressure of at least 500 psi and a temperature of at least 50° C., wherein R can be any alkyl and wherein the bidental phosphine ligand is of the formula

$Ph_2P(CH_2)_nPPh_2$

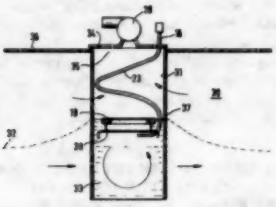
wherein n=2, 3, or 6 and Ph represents phenyl.

4,892,688

ARRANGEMENT FOR EXPELLING LIGHT VOLATILE CONTAMINANTS FROM LIQUIDS

Bruno Bernhardt, Reutlingen-Betzingen, Fed. Rep. of Germany, assignor to IEG Industrie-Engineering GmbH, Reutlingen, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,942
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—24 **2 Claims**



1. An arrangement for expelling volatile contaminants from a liquid, comprising a receptacle for receiving the liquid to be decontaminated, said receptacle having a top cover formed with an opening; a suction blower arranged in said opening to generate underpressure in a free space between a top surface of said liquid and said cover by exhausting air therefrom; a gas receiving container having an open bottom and a perforated top wall arranged below the top surface of the liquid in said receptacle and extending substantially parallel thereto; suction conduit means connecting said gas receiving container with the outer atmosphere whereby, upon creation of an underpressure in the free space outer air is sucked through said suction conduit means and is discharged in the form of bubbles through the perforations of said top wall to ascend through the liquid into said free space, said receptacle being a borehole drilled vertically in the ground and reinforced at least partially by one of a perforated casing and sieve rings.

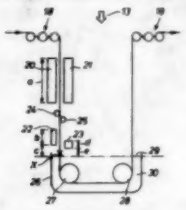
4,892,689

PROCESS FOR MAKING CURLED PHOTOGRAPHIC FILM

Jan B. Van Cappellen, Schilde; Luc M. De Groot, Aarschot; Gery Vancoppenolle, Weerde; Daniël G. Vandenbrande, Mortsel, and Jan K. De Keyzer, Schilde, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Jul. 14, 1988, Ser. No. 218,919
Claims priority, application Hague, Jul. 14, 1987, EP8720/348.7
Int. Cl.[4] B29C *35/10*
U.S. Cl. 264—25 **10 Claims**

1. In a process for making biaxially oriented photographic polyethylene terephthalate film by the steps comprising extruding molten polyethylene terephthalate polymer through a flat die slot onto a cooling drum to cool down the same, subjecting the film to molecular orientation by stretching the cooled down film longitudinally and transversely, and heat-setting the film, wherein the film is longitudinally stretched by applying longitudinal stretching forces to the film while heating the film, said heating comprising first pre-heating the film to increase the film temperature but not sufficiently for plastic elongation to occur, and then stretching the film while it is heated to a temperature above the Tg (glass transition temperature) in a zone where the film is unsupported, whereby rapid plastic elongation occurs under the stretching forces, and then rapidly cooling to a temperature below the Tg to arrest the stretching; the improvement of imparting longitudinal curvature of a given degree by the steps of controlling the heating of the film during longitudinal stretching so that a temperature



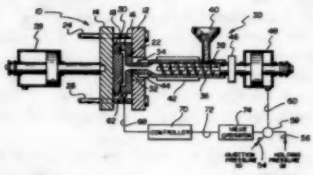
gradient Delta T exits across the film thickness from one surface of the film to the other which is larger than 10° C., and regulating the longitudinal tension applied to the film during such stretching to less than 10 N/sq. mm.

4,892,690

METHOD OF DATA ACQUISITION AND APPLICATION FOR AN INJECTION MOLDING PROCESS

Frederick J. Buja, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1988, Ser. No. 208,918
Int. Cl.[4] B29C *45/57*
U.S. Cl. 264—40.1 **5 Claims**



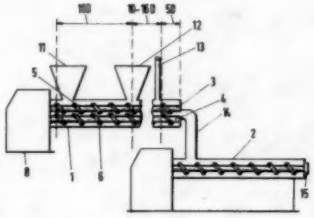
1. In an injection molding method utilizing an injection molding machine having a pair of separable mold elements forming a mold cavity therebetween and arranged for separation for the removal of a molded product, means for opening and closing the mold elements, and injection means for injecting a moldable material into said mold cavity at a first pressure and for exerting a second pressure on said moldable material as it cures in said cavity, the method of data acquisition and application in the operation of said injection machine comprising the steps of closing said mold elements, injecting the moldable material into said mold cavity at said first pressure, measuring the separation of the mold elements during the injection of the moldable material, changing the injection pressure from said first pressure to said second pressure upon detecting a predetermined separation known to produce an acceptable product, maintaining said second pressure until the thermoplastic material has cured, opening said mold and ejecting the cured product, detecting the maximum separation of said mold elements, accumulating said maximum separation measurements from a plurality of mold cycles while producing the acceptable products, then selecting a value for said predetermined separation of said mold elements at 30-70% of the greatest maximum separation measurement accumulated, and substituting said selected value of said separation for said predetermined separation for use during subsequent cycles to improve product quality.

4,892,691

EXTRUSION METHOD AND APPARATUS FOR PRODUCING A FOAMABLE MIXTURE OF PLASTICS MATERIAL

Klaus-Dieter Kolossow, Hambühren, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,319
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722050
Int. Cl.[4] B29C 47/50, 67/22
U.S. Cl. 264—54 11 Claims



1. A method of producing a foamable mixture of plastics materials from two plastics materials having differing properties in a tandem extruder system comprising first and second screw extrusion devices, said first extrusion device having a variable throughput and having associated therewith sequential, longitudinally spaced first, second and third feed apertures, the method comprising the steps of:

(a) feeding a high-molecular weight, high-temperature-resistant plastics material into said first extrusion device through said first feed aperture, and fusing said material therein,

(b) feeding a second low-molecular weight, low-temperature-resistant plastics material, together with a blowing agent, through said second feed aperture into said fused, homogenised high-molecular weight plastics material and fusing and homogenizing said second plastics materials and blowing agent therewith,

(c) introducing a propellant into said fused and homogenised mixture of said plastics materials and blowing agent through said third feed aperture in said first extrusion device,

(d) homogenizing said mixture of plastics materials, blowing agent and propellant in the first extruder,

(e) transferring said homogenised and fused mixture into said second extruder,

(f) cooling said mixture in said second extruder, and

(g) extruding said mixture in the form of a foamed tubular film or profile.

4,892,692

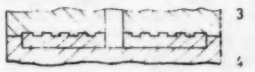
PROCESS FOR PRODUCING SUBSTRATE FOR OPTICAL DISK BY ANNEALING SUBSTRATE WITH GRADIENT DOUBLE REFRACTION DISTRIBUTION

Kunio Takada, Kawasaki, and Teruaki Okuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,687
Claims priority, application Japan, Jan. 30, 1987, 62-18476
Int. Cl.[4] B29D 11/00
U.S. Cl. 264—106 12 Claims

1. A process for producing a substrate for optical disks, comprising steps of:

forming a disk-shaped substrate with polycarbonate with such gradient distribution of double refraction that the value of double refraction is in a range from −10 to −30 nm in the vicinity of the external periphery of said substrate and is in a range from +10 to +30 nm in the vicinity of the center thereof; and



annealing thus formed substrate.

4,892,693

METHOD OF MAKING FILAMENT GROWTH COMPOSITE

Anthony J. Perrotta, Monroeville; Donald K. Grubbs, Rector; William H. Quayle, Murrysville, and Thomas B. Gurganus, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 24, 1987, Ser. No. 77,451
Int. Cl.[4] B22D 19/14; B32B 5/02
U.S. Cl. 264—108 21 Claims

1. A process for forming a novel composite comprising providing a substrate bearing crystalline filaments as growths on the substrate and forming a solid matrix encompassing the filaments, wherein the filaments are substantially uni-directional in a direction other than perpendicular to the substrate.

4,892,694

DEACTIVATION OF SPENT SILICON POWDER

Alan Ritzer, Sand Lake; George P. Moloney, Jr., Halfmoon, and Jack C. Leunig, Albany, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 41,184, Apr. 22, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,243
Int. Cl.[4] B27N 3/00; C01B 33/08
U.S. Cl. 264—109 10 Claims

1. A process for stabilizing finely divided residual silicon powder contaminated with chlorine, hydrogen and oxygen comprising:

(a) pelletizing the silicon powder and

(b) impregnating the pellets with an organic binder whereby the impregnated pellets of residual silicon are made stable for safe transportation and disposal.

4,892,695

PROCESS FOR MAKING A MOLDABLE FIBROUS MAT

David W. Bainbridge, Lakewood, and Mario P. Tocci, Littleton, both of Colo., assignors to Manville Corporation, Denver, Colo.

Division of Ser. No. 204,843, Jun. 10, 1988, Pat. No. 4,826,724. This application Feb. 9, 1989, Ser. No. 308,294
Int. Cl.[4] B29C 35/02, 69/00; B32B 17/04, 25/02
U.S. Cl. 264—119 5 Claims

1. A process for the production of a fibrous mat consisting essentially of the steps of:

(a) combining about (i) 20–60 wt % glass fibers; (ii) 10–60 wt % polyolefin fibers; (iii) 1–50 wt % fibers selected from the group consisting of polyamide fibers; polyester fibers; and mixtures thereof; and (iv) 20–50 wt % latex which will cross-link at a temperature in the range of about 75°–300° F.;

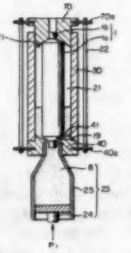
(b) consolidating the fibers and binder into a loosely packed mat;
(c) curing the consolidated mat of fibers and binder at a temperature in the range of about 250°–400° F.; and
(d) thereafter molding the cured mat of fibers into an insulation shape at ambient temperature conditions.

4,892,696

METHOD FOR PRODUCING A RUBBER OR PLASTIC-COATED ROLLER

Takatoshi Murakami; Toshio Kida, both of Yokohama; Shiji Kou, Sagamihara; Toshinobu Asai, Yokohama, and Yoshiyuki Nunome, Kawasaki, all of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kanagawa, Japan

Division of Ser. No. 891,660, Aug. 1, 1986, Pat. No. 4,766,843. This application Jun. 8, 1988, Ser. No. 203,896
Claims priority, application Japan, Aug. 2, 1985, 60-171640; Aug. 26, 1985, 60-129819
Int. Cl.[4] B29C *33/40*
U.S. Cl. 264—219 **5 Claims**



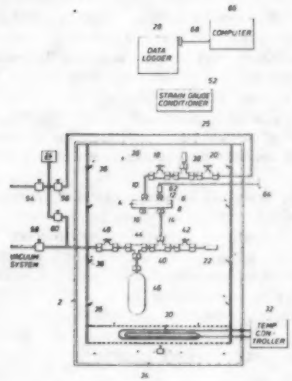
1. A method for coating a core shaft with a rubber or plastic layer to form a rubber or plastic coated roller, comprising the steps of:
(a) guiding a core shaft having tapered surfaces formed at the opposite ends thereof into a cylindrical mold having an upright molding cavity, an open upper part and an open lower part, said lower part being closed by a lower plug inserted in said lower part, wherein said lower plug has an externally tapered surface and a material injection hole at the center thereof, said tapered surface of said lower plug corresponding to said tapered surface at one of said core shaft for guiding said core shaft into a predetermined position in said lower part of said cylindrical mold;
(b) inserting a slidable upper plug into said open upper part of said cylindrical mold, said upper plug having an externally tapered surface and a vent hole at the center thereof, said tapered surface of said upper plug corresponding to said tapered surface at the other end of said core shaft for guiding said core shaft into a predetermined position in said upper part of said cylindrical mold;
(c) forcing said slidable upper plug downwards within said cylindrical mold with an elastic means thereby holding said tapered surface at one end of said core shaft against said tapered surface of said lower plug;
(d) injecting liquid rubber or plastic material into said molding cavity under pressure through said material injection hole in said lower plug, thereby causing said tapered surface of said core shaft to pushed upwards away from said tapered surface of said lower plug to form a gap therebetween, the air in said molding cavity to be vented through said air vent hole, and said molding cavity to be filled through said gap with said liquid rubber or plastic material until said liquid rubber or plastic material overflows through said air vent holes, filling of said molding cavity resulting in equilibration of upward pressure on said core shaft and inner mold cavity pressure so that said elastic means forces said core shaft downward to close said gap and maintain pressure within said molding cavity; and
(e) removing said rubber or plastic coated roller from said cylindrical mold after said liquid rubber or plastic material has set.

4,892,697

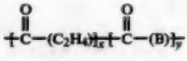
PROCESS FOR PREPARING MELT PROCESSED POLYKETONE-BASED BARRIER POLYMER MATERIALS

Leonard E. Gerlowski, and John R. Kastelic, both of Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 128,968
Int. Cl.[4] B29C *71/02*
U.S. Cl. 264—234 **7 Claims**



1. A process for preparing a melt processed polymer material having improved oxygen, water or carbon dioxide barrier properties comprising the steps of:
(a) melt processing a quantity of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon to form a film wherein said polymer is of the formula



wherein B is the moiety of an ethylenically unsaturated α-olefin of at least 3 carbon atoms polymerized through the ethylenic unsaturation and the ratio of y:x is no more than about 0.5;
(b) heating said melt processed film to a temperature ranging from about 2° C. to about 40° C. above the melting point of the polymer; and
(c) cooling said heated melt processed film at a moderate rate between about 6° C. and about 10° C. per minute to form a melt processed polymer material.

4,892,698

METHOD FOR MANUFACTURING PRODUCTS WITH BRISTLES

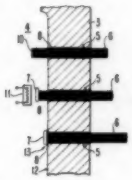
Georg Weihrauch, Waldmichelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Waldmichelbach, Fed. Rep. of Germany

Filed Mar. 28, 1986, Ser. No. 845,342

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511528

Int. Cl.[4] B29D *31/00*

U.S. Cl. 264—243 12 Claims



1. Method for manufacturing products with bristles, the product including a bristle holder of a castable or foamable material and plastic bristles anchored therein, the method comprising the steps of inserting the bristles, either individually or as strands of bristles through channels into a mold for the bristle holder, melting the bristles by heat at an end in the mold to form a thickening, filling the mold with bristle holder material, and bringing the thickening on the bristles into sealing contact with an opening of the channel guiding the bristles by tensile forces applied to the bristles before the bristle holder material enters the mold thereby positively sealing the opening of the channel by the thickening at the end of the bristles.

4,892,699

METHODS FOR INJECTION MOLDING AND INJECTION BLOW MOLDING MULTI-LAYER ARTICLES

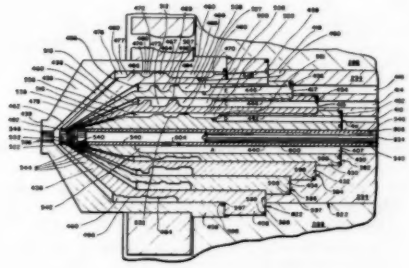
Frederick G. Kudert, Niles; Maurice G. Latreille, Batavia; Robert J. McHenry, St. Charles; George F. Nahill, Crystal Lake, all of Ill.; Henry Pfutzenreuter, III, Loma, Calif.; William A. Tennant, Schaumburg, Ill.; Thomas T. Tung, Hoffman Estates, Ill., and John Vella, Jr., Aurora, Ill., assignors to American National Can Company, Chicago, Ill.

Division of Ser. No. 484,707, Apr. 13, 1983, Pat. No. 4,712,990.

This application Sep. 19, 1986, Ser. No. 909,288

Int. Cl.[4] B29C *45/16*

U.S. Cl. 264—328.8 101 Claims



1. A method for forming multi-layer plastics articles wherein said method involves use of a multi-cavity injection molding machine, characterized in that a combined material stream is injected from each of a plurality of co-injection nozzle means of said machine into an associated injection cavity to form each article, said method being further characterized by:

providing streams of polymeric materials to form the corresponding layers of the articles, and moving each material stream separately to each of the nozzle means,

forming the combined stream in the plural nozzle means from the separate material streams, and

injecting the combined streams to form the multi-layer plastics articles.

4,892,700

PROCESS FOR MAKING MULTILAYERED, FORMABLE LAMINATES

Carlos Guerra, Fairfield; John Lee, Norwalk, and Mark Johnson, Bridgeport, all of Conn., assignors to Polycast Technology Corporation, Stamford, Conn.

Filed Oct. 7, 1987, Ser. No. 106,191

Int. Cl.[4] B29C *47/06, 51/02, 51/10, 51/14*

U.S. Cl. 264—510 31 Claims

1. A process for producing a laminate which comprises:

preparing an acrylic composition comprising an acrylic monomer and at least one free radical reaction initiating catalyst;

casting said acrylic composition upon at least a portion of one surface of at least one thermoplastic material; and

curing said cast acrylic composition in multiple stages at a sufficient temperature and for a sufficient time in each stage such that a major portion of said acrylic monomer is polymerized in a first stage and the remaining unpolymerized acrylic monomer is cured in a final stage so as to permit partial penetration of said acrylic monomer into said thermoplastic material to form a multilayer, formable laminate having a controllable gradient of polymerized acrylic monomer therethrough and increased resistance to debonding during subsequent handling, forming, or other manufacturing operations.

4,892,701

DEVICE FOR MEASURING NUCLEAR REACTOR FUEL ASSEMBLY GRIDS

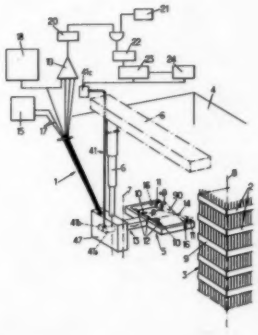
Christian Mauvieux, Lyons; Bernard Gebelin, Tassin, and Philippe Herbaut, Lyons, all of France, assignors to Framatome, Courbevoie and Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, both of, France

Filed Nov. 20, 1987, Ser. No. 123,461

Claims priority, application France, Nov. 20, 1986, 86 16135

Int. Cl.[4] G21C *17/06*

U.S. Cl. 376—258 6 Claims



5. A measuring device for remotely measuring dimensions of an external lateral face of a nuclear fuel assembly grid, comprising

(a) supporting means carrying a set of two ultrasonic transducers aligned along a common direction substantially parallel to said lateral face, facing each other, and mutually spaced by a distance larger than the length of said lateral face, each transducer for measuring the distance thereof with a side of said lateral face; and

(b) displacement means connected to said supporting means through connecting means and arranged for rectilinearly moving said supporting means towards said lateral face along a direction orthogonal thereto, until abutment means carried by the supporting means are in abutting contact with said lateral face, said abutment means being arranged for maintaining said common direction parallel to said lateral face when forced into contact with said lateral face;

(c) said connecting means having:

(i) first rotation means allowing the supporting means to rotate about an axis parallel to a longitudinal axis of the grid parallel to the sides of said lateral face responsive to abutting contact of said abutment means with said lateral face; and

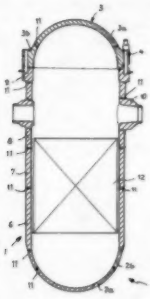
(ii) second rotation means for forcibly rotating said supporting means about a further axis perpendicular to said lateral face and to the longitudinal axis of the grid throughout a predetermined limited angular range symmetrical with respect to a reference position, where said common direction is substantially perpendicular to the longitudinal axis of the grid, responsive to further movement of said displacement means after said abutment means have initially come into contact with said lateral face.

4,892,702

LIGHT-WATER NUCLEAR REACTOR VESSEL AND PROCESS FOR ITS MANUFACTURE

Alain Vignes, Paris, France, assignor to Framatome, Courbevoie, France

Filed Oct. 17, 1988, Ser. No. 258,358
Claims priority, application France, Oct. 16, 1987, 87 14323
Int. Cl.[4] G21C *13/08, 21/00*
U.S. Cl. 376—294 **6 Claims**



1. Process for the manufacture of a light-water nuclear reactor vessel comprising a shell having a thickness, greater than 100 mm, symmetrical in revolution, consisting in shaping at least two unit components of overall symmetrical shape in revolution and in assembling said unit components by welding over their entire thickness to produce the nuclear reactor vessel, wherein the unit components (*2a*, *2b*, 6, 7, 8, 9, 10, *3a*, *3b*) are made of a steel containing 2 to 2.50% of chromium, 0.9 to 1.1% of molybdenum and less than 0.15% of carbon, and the assembly of the unit components is carried out by welding by means of an electron beam, in a single pass, without filler metal, over the entire thickness of the unit components.

4,892,703

SURFACE STRUCTURE OF AlN SUBSTRATE AND A PROCESS FOR PRODUCING THE SAME

Satoshi Iio, and Akiyasu Okuno, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Division of Ser. No. 30,253, Mar. 9, 1987, Pat. No. 9,840,853.
This application Mar. 24, 1989, Ser. No. 328,289
Claims priority, application Japan, Mar. 8, 1986, 61-51213
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—13 **3 Claims**

1. A process for producing a surface structure on an AlN substrate comprising:

coating a surface of the AlN substrate with metallizing layer components,

heat treating the resultant coated substrate at a temperature of 200°–500° C. under an oxidizing atmosphere, and

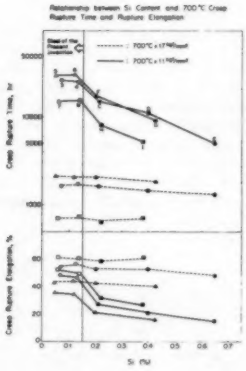
further heating the heat treated coated substrate at a temperature of 1200°–1400° C. under a nonoxidizing atmosphere having a dew point of −35° to 5° C..

4,892,704

LOW SI HIGH-TEMPERATURE STRENGTH STEEL TUBE WITH IMPROVED DUCTILITY AND TOUGHNESS

Yoshiatsu Sawaragi, Nishinomiya, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Aug. 8, 1988, Ser. No. 232,636
Claims priority, application Japan, Apr. 28, 1988, 63-106794
Int. Cl.[4] C22C *38/48*
U.S. Cl. 420—59 **8 Claims**


Relationship between Si Content and 700°C Creep Rupture Time and Rupture Elongation
Creep Rupture Time, hr
Creep Rupture Elongation, %
Si (%)

1. A low Si high-temperature strength steel tube with improved ductility and toughness which consists essentially of:

not more than 0.10 wt% of carbon (C), not more than 0.15 wt% of silicon (Si), not more than 5 wt% of manganese (Mn), 22 to 27 wt% of chromium (Cr), 15 to 25 wt% of nickel (Ni), 0.2 to 0.35 wt% of nitrogen (N), 0.10 to 1.0 wt% of niobium (Nb) and not more than 0.005 wt% of oxygen (O_2); and

at least one of 0.020 to 0.1 wt% of aluminum (Al) and 0.003 to 0.02 wt% of magnesium (Mg) in an amount defined by the following formula:

$0.006(\%) \leqq (1/5Al+Mg) \leqq 0.020(\%)$ the balance being Fe and inevitable impurities.

4,892,705

METHOD OF PRODUCING VAPOR FOR USE IN A VAPOR STERILIZING PROCESS

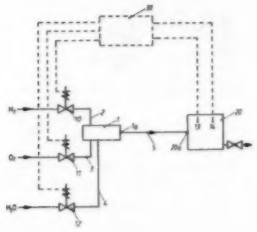
Hans J. Sternfeld, Jagsthausen; Karlheinz Wolfmüller, Eppingen-Adelshofen; Rodhardt Froese, Schömberg, and Manfred Paulus, Pforzheim, all of Fed. Rep. of Germany, assignors to Fr. Kammerer GmbH, Huchenfeld and Deutsche Forschungs- und Versuchsaustalt fur luft-und Raumfahrt e.V., Bonn, both of, Fed. Rep. of Germany

Continuation of Ser. No. 836,969, Mar. 6, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 178,882

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508043

Int. Cl.[4] A61L *2/06*

U.S. Cl. 422—26 5 Claims



1. A method of sterilizing objects comprising the steps of:

supplying hydrogen and oxygen at preselected supply rates in a stoichometric ratio into a combustion chamber;

burning the hydrogen with the said oxygen to generate hot combustion gases;

simultaneously introducing liquid water at a certain supply rate into said combustion gases whereby the water is evaporated to generate sterilizing steam;

introducing said sterilizing steam into a vessel housing said objects;

sensing vapor pressure and vapor temperature of said sterilizing steam; and

controlling the sterilization conditions by controlling the proportional supply rates of hydrogen and oxygen and independently thereof controlling the supply rate of the liquid water responsive to the sensed vapor pressure and vapor temperature thereby controlling the vapor supply rate, the vapor pressure and the vapor temperature independently and separately from each other.

4,892,706

AUTOMATED LIQUID STERILIZATION SYSTEM

Raymond C. Kralovic, Springfield, Pa., and Edward T. Schneider, Mentor, Ohio, assignors to Steris Corporation, Painesville, Ohio

Continuation-in-part of Ser. No. 826,730, Feb. 6, 1986, Pat. No. 4,731,222. This application Jan. 4, 1988, Ser. No. 140,388

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] A61L *2/18, 2/24;* C23F *13/00*

U.S. Cl. 422—28 17 Claims

1. A method of sterilizing medical instruments, the method comprising:

disposing a medical instrument to be sterilized in a storage module;

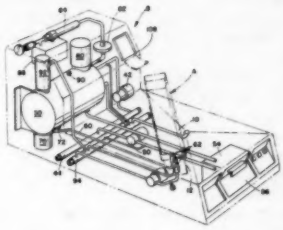
closing the module to penetration by microbial contamination;

removably attaching the storage module with tubing which interconnects the attached module with a source of liquid rinse solution;

completely filling the interconnecting tubing from the module to the rinse solution source and the module with a liquid sterilant which includes peracetic acid;

retaining the liquid sterilant in the module and the interconnecting tubing for a pre-selected duration, which preselected duration is sufficiently long to sterilize the module, the medical instrument, and the interconnecting tubing;

passing a sterilized liquid rinse solution from the rinse solution source only through the sterilized interconnecting tubing into the sterilized module to rinse the liquid sterilant from the interconnecting tubing, the module, and the medical instrument, whereby the liquid rinse solution passes only in contact with sterilized surfaces to prevent contamination of the liquid rinse solution;



detaching the module from the interconnecting tubing while maintaining the module closed to microbial contamination; and,

storing the module and the medical instrument as a unit.

4,892,707

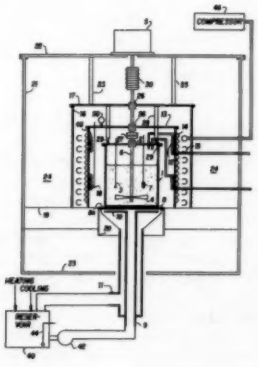
APPARATUS FOR THE CALORIMETRY OF CHEMICAL PROCESSES

Gerald W. Stockton, Morrisville; Dale H. Chidester, Levittown, both of Pa., and Susan J. Ehrlich, Hamilton Township, Mercer County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 25, 1983, Ser. No. 517,189

Int. Cl.[4] G01N *25/20*

U.S. Cl. 422—51 17 Claims



9. A calorimeter for use in examining chemical processes comprising:

(a) a flat bottomed reaction vessel;

(b) a gas-tight cover for said reaction vessel having at least two chemical inlet ports;

(c) an agitator mechanism disposed within said reaction vessel;

(d) a first temperature sensor disposed within said reaction vessel;

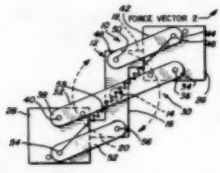
(e) a calibration heater disposed within said reaction vessel;
(f) a pressure relief mechanism for relieving overpressure in said reaction vessel;
(g) a heat exchanger in intimate thermal contact with the base of said reaction vessel for regulating heat flow to the vessel and a reaction mass disposed therein, including means to supply coolant at a determined temperature and flow rate and an electric heater;
(h) an adiabatic shield surrounding said reaction vessel, to prevent uncontrolled heat leakage from said vessel, said adiabatic shield comprising a closed barrier vessel having a cover;
(i) an electrical heater for heating said adiabatic shield;
(j) means for cooling said adiabatic shield with a coolant supplied at constant flow and temperature;
(k) a second temperature sensor disposed in the space between said adiabatic shield and said reaction vessel;
(l) means for supplying chemical feed streams to said chemical inlet ports;
(m) means to equilibrate the temperature of said chemical feed streams;
(n) means for driving said agitator mechanism; and
(o) temperature regulation means receiving inputs from said first and second temperature sensors and providing outputs to said calibration heater, said heat exchanger electrical heater, and adiabatic heat shield electric heater and to said means to supply coolant, such as to maintain said defined fluid temperature in said coolant.

4,892,708

FLUID SEPARATION AND PROCESSING DEVICE

Frank W. Wegoman, South Bend, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Jul. 1, 1987, Ser. No. 68,451
Int. Cl.[4] G01N *21/07*
U.S. Cl. 422—72 **16 Claims**



1. An assembly for separating, metering, diluting and delivering a fluid, comprising:
a central rotating member rotatable about a fixed spin axis;
a processing chamber holding member; and centrifugally actuated means for connecting said processing chamber holding member to said central rotating member and for translating said processing chamber holding member in response to a change in centrifugal force acting on said centrifugally actuated means from a first position relative to said spin axis to a second position relative to said spin axis thereby changing the direction of centrifugal force acting on said processing chamber holding member, wherein said second position is at greater distnce from said axis than said first position.

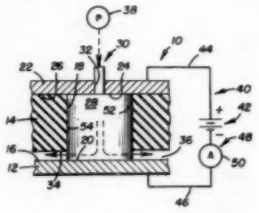
4,892,709

MICRODEVICE FOR GAS AND VAPOR SENSING

Karl W. Frese, Jr., Cupertino, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Oct. 2, 1987, Ser. No. 104,338
Int. Cl.[4] H01L *7/00*; H01C *13/00*
U.S. Cl. 422—98 **23 Claims**

19. A microdevice for gas and vapor sensing, comprising:
an electrically conductive substrate having a substrate surface;
an electrically conducting member having a member surface generally parallel to said substrate surface;
an electrical insulator sandwiched between and abutting said substrate surface and said member surface, said insulator having an opening therethrough exposing facing portions of said substrate and member surfaces, said insulator and said facing portions of said substrate and member surfaces defining an ionization chamber;



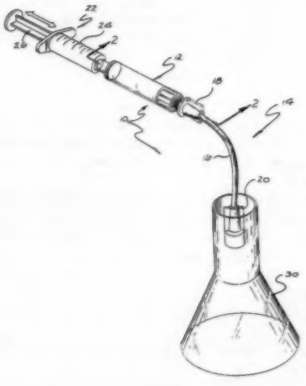
means for flowing gas through said chamber;
means for applying a sufficient voltage difference between said substrate and said member to provide a voltage gradient therebetween of at least about 10^4 V/cm and to cause a current to flow between said substrate and said member; and
means for measuring the current flowing between said substrate and said member.

4,892,710

CARTRIDGE ASSEMBLY WITH MULTI-PURPOSE CLOSURE TUBING

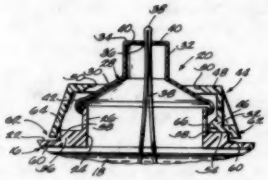
Raphael C. Wong, and That T. Ngo, both of Irvine, Calif., assignors to Bioprobe International, Inc., Tustin, Calif.

Filed Jul. 7, 1987, Ser. No. 70,764
Int. Cl.[4] B01L *3/00*
U.S. Cl. 422—102 **9 Claims**



1. A cartridge assembly which comprises:
at least one cartridge means for sampling, testing or purifying materials having a male end and a female end; and
a closure tubing having a female end adapted to close the male end of said cartridge means and a male end adapted to close the female end of said cartridge means.

4,892,711
FRAGRANCE DISPENSING DEVICE
Donald W. Tendick, Sr., Wauwatosa, Wis., assignor to Lamplight Farms, Inc., Wauwatosa, Wis.
Filed Dec. 31, 1987, Ser. No. 139,909
Int. Cl.[4] A61L *9/02*
U.S. Cl. 422—125 **11 Claims**

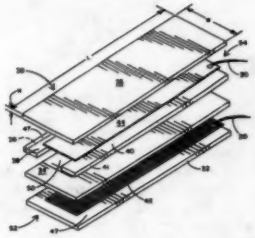


1. A fluid burning lamp comprising
a canister containing a combustible fluid and having a top wall including an opening and an upstanding collar surrounding said opening;
a burner assembly mounted on said canister over said opening and including a wick having a lower portion which extends into the combustible fluid and an exposed upper portion which can be lit to provide a flame and further including a metal cap member which fits over said collar and has a central raised portion which holds the upper portion of said wick; and;
a ring-like fragrance dispensing element made from a solid, synthetic, polymeric, plastic material containing about 5 to about 20 weight % of a vaporizable fragrance material uniformly dispersed throughout and mounted on said canister and surrounding said burner assembly such that, when said wick is lit, heat from said burner vaporizes and drive said fragrance material from said plastic material, said element being arranged to cooperate with said canister to prevent contact of any part of said element with said cap member.

4,892,712
FLUID PURIFICATION
Michael K. Robertson, and Robert B. Henderson, both of London, Canada, assignors to Nutech Energy Systems Inc., London, Canada
Filed Sep. 4, 1987, Ser. No. 94,000
Int. Cl.[4] B01J *1/10, 19/08;* **G01N** *21/01, 21/51*
U.S. Cl. 422—186 **28 Claims**

1. A matrix for use in a method of removing, reducing or detoxifying organic pollutants from a fluid, characterized by a porous substrate having a photoreactive metal semiconductor material bonded with, to or into surfaces of said substrate, said substrate comprising a filamentous, fibrous or stranded base material through which the fluid can flow in intimate contact with the photoreactive material.

4,892,713
OZONE GENERATOR
James J. Newman, 4703 Portland Rd. #34, Salem, Oreg. 97305
Filed Jun. 1, 1988, Ser. No. 200,826
Int. Cl.[4] B01J *19/08, 19/12*
U.S. Cl. 422—186.07 **20 Claims**



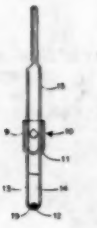
19. A generator for forming ozone from air, said generator requiring a low amount of energy and no coolant and being adapted to be connected to a 120 volt electrical power source, said generator comprising:
a unitary grid assembly having:
a first porcelain dielectric plate;
a second porcelain dielectric plate spaced apart from said first dielectric plate, wherein said first and said second dielectric plates are of the same size and shape;
a stainless steel wire mesh anode located between said first and said second dielectric plates, said anode being sized smaller than said dielectric plates and spaced away from the perimeter of said dielectric plates, the perimeters of said dielectric plates being bonded directly together thereby forming a sealed anode assembly wherein said anode is sealed in and between the central portion of said first and said second dielectric plates;
a stainless steel cathode plate sized smaller than said dielectric plates and spaced away from said second dielectric plate; and
a pair of porcelain dielectric spacers located between said second dielectric plate and said cathode plate, the width of each of said pair of dielectric spacers being less than the width of said anode assembly, the outside perimeter of said second dielectric plate being bonded to the outside perimeter of said pair of dielectric spacers, said cathode plate being spaced away from the outside perimeter of said pair of dielectric spacers,
wherein said second dielectric plate, said pair of spacers and said cathode plate define a space for the passage of air and the formation of ozone formed from the air;
means, located spaced from but adjacent said grid assembly, for moving air through said space;
a transformer;
means for connecting said transformer to said anode and said cathode plate;
means for connecting said transformer to a power source; and
means for emitting ozone formed is said generator from said generator.

4,892,714

RECRYSTALLIZATION APPARATUS

Robert L. Stevens, South Harpswell, Me., assignor to Microscale Organic Laboratory Corporation, Newcastle, N.H.

Filed Oct. 13, 1988, Ser. No. 257,209
Int. Cl.[4] B01D *35/00*
U.S. Cl. 422—245 4 Claims



1. Recrystallization apparatus comprising:

a. A tube having an upper portion joined by a constriction to a closed bottom portion of said tube;

b. a plug of plastic material fitting inside said upper portion and having a nose end too large to pass said constriction;

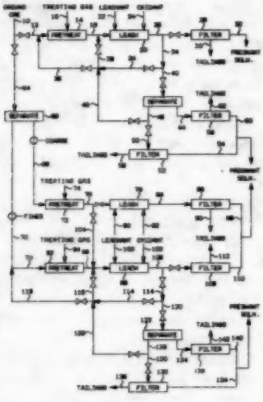
wherein one of said nose end and said constriction is circular in cross-section while the other is noncircular so as to provide an open area between said nose end and said constriction which is of the size that allows passage of liquid while blocking passage of crystals therethrough.

4,892,715

RECOVERING MINERAL VALUES FROM ORES

Robert L. Horton, Chagrin Falls, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1982, Ser. No. 451,699
Int. Cl.[4] C22B *60/02*
U.S. Cl. 423—20 13 Claims



1. A method for recovering uranium from ground uranium-containing ore, comprising:

(a) pretreating said ground ore with a gas selected from the group consisting of (1) a halogen gas and (2) a nitrogen oxide gas, in at least one pretreating step for a time sufficient to essentially saturate said ore with said gas;

(b) leaching said ground ore with an aqueous leach solution, comprising; less than about 180 pounds per ton of ore of sulfuric acid and less than about 10 pounds per ton of sodium chlorate, at a temperature between atmospheric temperature and about 80° C., in at least one leaching step;

(c) separating a first part of the effluent from said leaching step into a pregnant leach solution containing said uranium values and residual solids; and

(d) separating a second part of the effluent from the leaching step into a coarse fraction and a fines fraction and at least part of the total fines fraction, containing fluids from the leaching step, is recycled to at least one of (1) the pretreating step and (2) the leaching step.

4,892,716

MOLDED CATALYST AND METHOD OF CATALYTIC GAS REACTIONS USING THE SAME

Kazunobu Abe, and Toshikatsu Umaba, both of Sakai, Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Division of Ser. No. 947,415, Dec. 24, 1986, Pat. No. 4,755,500.
This application Apr. 19, 1988, Ser. No. 183,155
Claims priority, application Japan, Dec. 27, 1985, 60-296957
Int. Cl.[4] B01D *53/36*
U.S. Cl. 423—213.7 1 Claim

1. A method of performing catalytic gas reactions in which a molded catalyst having openings therethrough is fitted in a reactor vessel having an inlet and an outlet for a reactant gas so that the openings extend in the direction of the flow of the reactant gas, and the catalyst is an integral molded unit which comprises a wear-resistant front portion facing the inlet and a continuation of the front surface extending therefrom, both the wear-resistant portion and continuation thereof constituting the front portion of the catalyst, and the remaining part made so wear-susceptible as to have either:

(a) a wearability of 2–10% in a shaking abrasion test wherein grinding particles having an average particle size of 1000 μm and a Mohs scale of 9 are placed in the openings of the catalyst in an amount of 50% by volume based on the total volume of the openings, and the catalyst is shaken for three hours with an amplitude of 77 mm and a frequency of 320 per minute; or

(b) a wearability of 7.5–35% in an air abrasion test wherein an air which contains silica particles having an average particle size of 40 μm in amounts of 70 g/m^3 is passed through in a reactor vessel including a rectangular parallelepipedic catalyst of 45 mm wide, 45 mm thick and 100 mm long so fitted thereinto, so that the catalyst extends longitudinally in the direction of the flow of the air for 30 min. at a superficial velocity of 40 m/sec. at the front fact of the catalyst,

said catalyst being wear-resistant over a length which is 1 to 20 times the equivalent diameter of the openings of the catalyst,

the method comprising: allowing grinding particles to exist continuously or intermittently in the reactant gas fed into the reactor vessel, thereby to wear the surface layer of the same remaining part of the catalyst with the grinding particles.

4,892,717

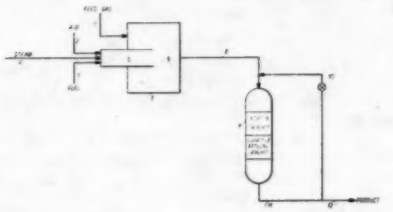
GAS TREATING PROCESS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 31, 1985, Ser. No. 761,065
Int. Cl.[4] C01B *33/00, 17/16, 3/12, 3/16*
U.S. Cl. 423—217 77 Claims

1. A process for preventing oxygen from deactivating a catalyst susceptible to deactivation by oxygen comprising (1) scavenging oxygen contained in a feed gas stream comprising carbon monoxide and water vapor as reactant gases in the presence of an oxidation catalyst under conditions which remove essentially all of said oxygen by reaction with hydrogen sulfide and (2) contacting the resultant gas stream, containing said reactants but essentially free of oxygen, with a catalyst

susceptible to deactivation by oxygen but active for the water gas shift reaction, said contacting in step (2) being under conditions resulting in the conversion of at least some of said carbon monoxide and water vapor to hydrogen and carbon dioxide.



4,892,718

DECONTAMINATION OF GASES BY SCRUBBING

Siegfried Peter, Lindenweg 3, D-8525 Uttenreuth, and Georg Haertel, Westtorgraben 9, D-8500 Nuernberg, both of Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 885,918

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525241

Int. Cl.[4] C01B *21/02*

U.S. Cl. 423—235 **15 Claims**

1. A method for removing of at least one of the following contaminants, COS, CS2, mercaptans, SOX and/or NOX from host gases, including the step of scrubbing the contaminant containing host gases at a normal or elevated pressure, at a temperature between about room temperature and 200 degrees Celsius, the improvement comprising, using in the step of scrubbing a solution of salts of at least one element of the following, scandium, yttrium, lanthanide or actinide groups, or mixtures thereof of such salts, the solution being in water and/or an organic solvent, to remore sulfur and/or nitrogen.

4,892,719

REMOVAL OF ALDEHYDES AND ACIDIC GASES FROM INDOOR AIR

Hyman D. Gesser, 218 Girton Blvd., Winnipeg, MB, Canada R3P 0A7

Filed Aug. 24, 1988, Ser. No. 235,493

Int. Cl.[4] B01J *8/00*; C10H *23/00*

U.S. Cl. 423—245.1 **12 Claims**

1. A method of reducing the indoor air concentration of aldehydes by coating a porous support filter with water soluble polymeric amine to which a water soluble low-volatile liquid plasticizer is added to render the coating soft and flexible and passing the indoor air through said support filter.

4,892,720

SUBSTITUTED ALUMINOSILICATE COMPOSITIONS AND PROCESS FOR PREPARING SAME

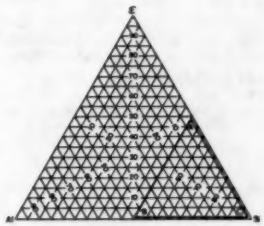
Gary W. Skeels, Brewster, and Richard Ramos, Bronx, both of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Apr. 26, 1984, Ser. No. 604,179

Int. Cl.[4] C01B *33/28*; C01G *23/04, 49/02*

U.S. Cl. 423—328 **14 Claims**

1. The process for preparing molecular sieves containing at least one of titanium and/or iron from a starting crystalline aluminosilicate which comprises contacting said crystalline aluminosilicate having pore diameters of at least about 3 Angstroms and having a molar SiO_2/Al_2O_3 ratio of at least 3, with a fluoro salt of titanium and/or iron, said fluoro salt being in the form of a solution or slurry, whereby framework aluminum atoms of the starting crystalline aluminosilicate are removed and replaced by at least one of titanium and iron.



4,892,721

CRYSTALLINE ZEOLITE MATERIALS CONSTITUTING MAZ-MORITE INTERMEDIATES

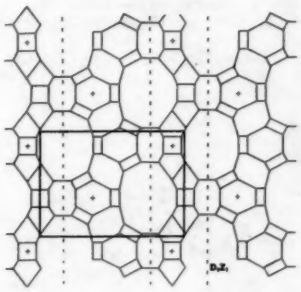
Michael E. Leonowicz, Neshanic Station; David E. W. Vaughan, Flemington, and Karl G. Strohmaier, Port Murray, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 713,050, Mar. 18, 1985, Pat. No. 4,657,748. This application Apr. 2, 1987, Ser. No. 33,244

The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **23 Claims**



1. A crystalline porous tectosilicate composition characterized as combining mordenite sheets with mazzite or 'omega' sheets, having orthorhombic unit cell parameters of 7.3Å (±0.2), 18.1Å(±0.3) and sum combinations of 10.6Å (±0.2) and 15.6Å(±0.3).

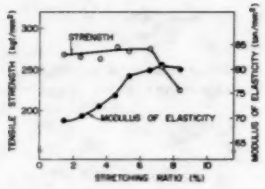
7. The composition of claim 1 having the configuration D_1Z_1.

4,892,722

METHOD FOR PRODUCING HIGH STRENGTH, HIGH MODULUS MESOPHASE-PITCH-BASED CARBON FIBERS

Yoshinori Suto; Toshiyuki Ito; Hideyuki Nakajima; Yoshiyuki Suzuki; Shin-ichi Nayuki, all of Ibarakiken; Hiroyasu Ogawa, and Harumitsu Enomoto, both of Shizuokaken, all of Japan, assignors to Petoca Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,990
Claims priority, application Japan, Jun. 5, 1987, 62-139980
Int. Cl.[4] C01B *31/04*
U.S. Cl. 423—448 1 Claim



1. A method for producing high strength, high modulus mesophase-pitch-based carbon fibers having a modulus of elasticity of 75 tonf/mm^2 or more and a tensile strength of 250 kgf/mm^2 or more which comprises heat treating mesophase-pitch-based carbon fibers at a temperature of 2600° C. to 2900° C. while stretching said fibers with a stretching ratio S which satisfies the relation of equation (1) in the case of a modulus of elasticity of 2 tonf/mm^2 or more and 10 tonf/mm^2 or less and the relationship of equation (2) in the case of a modulus of elasticity of 10 tonf/mm^2 or more and 70 tonf/mm^2 or less.

$$0.337M+0.79 \leqq S \leqq 0.371M+5.06 \quad (1)$$

$$-0.102M+7.38 \leqq S \leqq -0.121M+9.98 \quad (2)$$

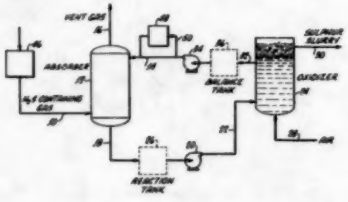
wherein M is a modulus of elasticity (tonf/mm^2) and S is stretching ratio (%)

4,892,723

METHOD FOR IMPROVING THE LONG-TERM STABILITY OF H_2S ABSORPTION-OXIDATION PROCESS SOLUTIONS

Dennis D. Delaney, Yorba Linda, and Hugh W. Gowdy, Irvine, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Sep. 12, 1988, Ser. No. 243,460
Int. Cl.[4] C01B *17/02*
U.S. Cl. 423—573.1 67 Claims



1. A hydogen sulfide removal process wherein an organically contaminated hydrogen sulfide-containing gas stream is contacted with a circulating, regenerable aqueous washing solution in which said washing solution first absorbs said hydrogen sulfide and then oxidizes it into sulfur particles, with said sulfur particles being removed and recovered, the process further comprising contacting at least a portion of said gas stream with charcoal to reduce the concentration of said organic contamination in said gas stream.

4,892,724

TARTAR INHIBITING ORAL COMPOSITIONS AND METHOD

Zahid Amjad, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 9, 1988, Ser. No. 191,668
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[4] A61K *7/16, 7/18, 9/68*
U.S. Cl. 424—49 19 Claims

1. An oral composition comprising:
(a) an effective amount of a fluoride source,
(b) effective amount of a dental abrasive; and
(c) 0.01 to 10% by weight of an anticalculus agent selected from at least one phosphorus-containing compound and at least one polymer in the weight ratio of 1:10 to 10:1; said compound is selected from the group consisting essentially of amino phosphonic acids, diphosphonic acids, phosphonoalkane carboxylic acids, hydroxy phosphonocarboxylic acids, polyphosphoric acids, polyol phosphate esters, amino phosphonates, salts thereof, and mixtures thereof and whereas said polymer is selected from the group consisting essentially of homopolymers of a carboxylic monomer selected from the group consisting essentially of monounsaturated monocarboxylic and dicarboxylic acids of 3 to 5 carbon atoms, salts and anhydrides of such acids, and mixtures of such carboxylic monomers, and from copolymers containing at least 30% by weight of such carboxylic monomer and at least 5% by weight of a principal comonomer.

4,892,725

TARTAR INHIBITION ON TEETH

Zahid Amjad, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 9, 1988, Ser. No. 191,667
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[4] A61K *7/16, 7/18, 9/68*
U.S. Cl. 424—49 19 Claims

1. Oral composition comprising:
(a) effective amount of a fluoride source,
(b) effective amount of a dental abrasive; and
(c) 0.01 to 10% by weight of an anticalculus agent of at least one polymer selected from homopolymers of carboxyl monomers selected from monounsaturated monocarboxylic and dicarboxylic acids of 3 to 5 carbon atoms, salts and anhydrides thereof, and at least one copolymer containing at least 30% by weight of said carboxyl monomer, which anticalculus agent yields synergistic results compared to the use of said homopolymer alone or said copolymer alone.

4,892,726

MAKEUP OR COSMETIC COMPOSITIONS

Kazuya Yonekura, and Shoji Daikuzono, both of Tokyo, Japan, assignors to Toshiba Silicon Co., Ltd., Japan

Filed May 20, 1988, Ser. No. 196,917
Claims priority, application Japan, May 29, 1987, 62-131349
Int. Cl.[4] A61K *7/21, 7/35, 7/2*
U.S. Cl. 424—63 3 Claims

1. A makeup or cosmetic composition comprising polymethylsilsesquioxane powders which has a mean particle diameter of 0.05 to 100 μm and where 80% or more of the polymethylsilsesquioxane particles are within the range of ±30% of the mean particle diameter.

4,892,727

COSMETIC OR DERMOPHARMACEUTICAL COMPOSITIONS CONTAINING A POWDER OF SWEET LUPINE SEEDS ESSENTIALLY FREE OF ALKALOIDS

Jean-Francois Grollier, Paris, France, assignor to Societe Anonyme dite: L'OREAL, Paris, France

Filed Jul. 24, 1986, Ser. No. 889,001
Claims priority, application Luxembourg, Jul. 24, 1985, 86021
Int. Cl.[4] A61K *7/02, 7/027, 7/035, 7/06*
U.S. Cl. 424—69 10 Claims

1. A topical composition for to the hair, skin and scalp, said composition being in the form of an emulsion, a cream, a lotion, a gel or a powder and comprising in a cosmetically acceptable vehicle, an effective amount of a powder of sweet lupine seeds essentially free of alkaloids.

4,892,728

PUMPABLE CATIONIC FATTY ALCOHOL DESPERSION

Rolf Kawa, Monheim; Holger Tesmann, Duesseldorf; Josef Wilhelm; Karl-Heinz Rose, both of Huenfeld, and Eugen Konrad, Darmstadt, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,844
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708425
Int. Cl.[4] A61K *7/075, 7/08, 7/021;* B01F *17/18*
U.S. Cl. 424—70 20 Claims

1. A cationic fatty alcohol dispersion having a high fatty alcohol content and a viscosity of about 0.5 to about 50 Pa.s at 20° C. comprising a mixture of:

(A) from more than 10 to about 25.0% by weight of a linear or branched, primary, saturated C_{14}–C_{22} fatty alcohol or mixtures of such alcohols;

(B) from about 0.01 to about 1.0% by weight of a cationic surface-active compound containing a quaternary ammonium, pyridinium or imidazolinium group and a linear C_8–C_{22} alkyl or 2-hydroxyalkyl group; and

(C) water in a quantity sufficient to adjust to 100% by weight.

4,892,729

SOAP-FREE, BRUSHLESS NON-LATHERING SHAVING CREAM

Paolo Cavazza, Rome, Italy, assignor to Avantgarde S.p.A., Pomezia, Italy

Filed Mar. 10, 1988, Ser. No. 166,317
Claims priority, application Italy, Mar. 18, 1987, 47739 A/87
Int. Cl.[4] A01K *7/15*
U.S. Cl. 424—73 10 Claims

1. A brushless non-lathering shaving cream characterized in that it comprises the following components:

(a) from 4 to 15% by weight of a long-chain alcohol selected from stearyl alcohol, lauryl alcohol, cetyl alcohol, myristyl alcohol and mixtures thereof;

(b) from 1 to 10% by weight of an anionic, nonionic, amphoteric or quaternary surfactant and emulsifying agent, provided that if the quaternary surfactant is present the anionic surfactant is absent, or

(c) from 1 to 10% by weight of an anionic, nonionic, amphoteric or quaternary surfactant or emulsifying agent, provided that if the quaternary surfactant is present the anionic surfactant is absent;

(d) from 1 to 10% by weight of a wetting agent selected from glycerol, propylene glycol, sorbitol and polyethylene glycol; and

(e) from 4 to 20% by weight of an emollient selected from mineral oils and VASELINE (petrolatum).

4,892,730

PROCESSES FOR PREPARATION OF SOLID, RAPIDLY RELEASED MEDICAMENT PREPARATIONS CONTAINING DIHYDROPYRIDINES

Ahmed Hegasy, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 864,677, May 19, 1986, which is a continuation of Ser. No. 728,123, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 433,570, Oct. 8, 1982, abandoned. This application Sep. 20, 1988, Ser. No. 247,009
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142853; Feb. 16, 1982, 3205399
Int. Cl.[4] A61K *31/78, 31/44*
U.S. Cl. 424—80 12 Claims

1. A process for the production of a solid medicament preparation, which process comprises dissolving 1 part by weight of dihydropyridine as active compound and 2.0 to 6.0 parts by weight of PVP having a mean molecular weight of 15,000 to 50,000, in 2 to 20 parts by weight of an amount of an organic solvent which is sufficient to dissolve the dihydropyridine and PVP, then granulating this resultant solution with 4 to 23 parts by weight of absorptive excipients comprising a mixture of 3.5 to 15 parts by weight cellulose, 0.25 to 4 parts by weight starch and 0.25 to 4 parts by weight crosslinked insoluble PVPP, then further processing the resulting granules to give the solid medicament preparation.

4,892,731

BIOLOGICAL INTESTINAL ANTISEPTICS

Tadashi Arai, Tokyo; Mamoru Tanaka, Nagano, and Akio Maeda, Chiba, all of Japan, assignors to Tadashi Arai, Tokyo, Japan

PCT No. PCT/JP87/00970, § 371 Date Aug. 9, 1988, § 102(e) Date Aug. 9, 1988
PCT Filed Dec. 11, 1987, Ser. No. 243,038
Claims priority, application Japan, Dec. 11, 1986, 61-293349
Int. Cl.[4] A61K *39/08*
U.S. Cl. 424—93 1 Claim

1. A biological intestinal antiseptic comprising, as the active component, cells or endospores of a butyric-acid bacterium *Clostridium butyricum* MII588-Sens 1 strain having the sensitivity that this strain is infected and lysed by bacteriophage KM1, or cells or endospores of a spontaneous mutant MII588-Res 1 strain which has been screened from the cultured colonies of the MII588-Sens 1 strain and exhibits resistance to bacteriophage KM1.

4,892,732

METHOD AND COMPOSITION FOR ENHANCING THE INSECTICIDAL ACTIVITY OF CERTAIN ORGANOPHOSPHORUS COMPOUNDS

Doris L. Parconagian, Pleasant Hill; Donald H. DeVries; Mark J. Costales, both of Concord, and Walter Reifschneider, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 125,909, Nov. 27, 1987, abandoned, which is a continuation of Ser. No. 489,422, Apr. 28, 1983, abandoned. This application Jan. 12, 1989, Ser. No. 296,545
Int. Cl.[4] A01N *25/08*
U.S. Cl. 424—409 13 Claims

1. An insecticidal composition which comprises an inert carrier and an insecticidally effective amount of an active mixture of toxicants which mixture comprises about 1 part by weight of O,O-diethyl O-(3,5-6-trichloro-2-pyridinyl)phosphorothioate in admixture with from ¼ part to about 4 parts by weight of a pyrimidinyl phosphoramidothioate selected from the group consisting of

O-(2-cyclopropyl-5-pyrimidinyl) O-ethyl N-(1-methylethyl)phosphoramidothioate,

O-(2-cyclopropyl-5-pyrimidinyl) O-ethyl N-n-propyl phosphoramidothioate and

N-cyclopropyl O-(2-cyclo-propyl-5-pyrimidinyl) O-ethyl phosphoramidothioate.

4,892,733

BIODEGRADABLE SYNTHESIS POLYPEPTIDE AND ITS THERAPEUTIC USE

Daniel Bichon, Gaillard, France; Bernard Lamy, Carouge, and William Borloz, Nyon, both of Switzerland, assignors to Imperial Chemical Industries PLC, London, England

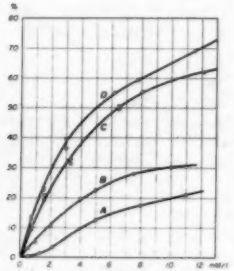
PCT No. PCT/CH86/00177, § 371 Date Aug. 18, 1987, § 102(e) Date Aug. 18, 1987, PCT Pub. No. WO87/03891, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 15, 1986, Ser. No. 101,298

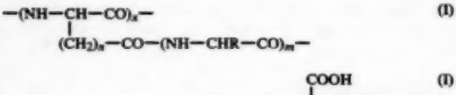
Claims priority, application Switzerland, Dec. 19, 1985, 5436/85

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—422 20 Claims

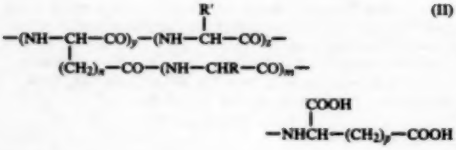


1. Hydrosoluble, biodegradable, carboxylated polypeptide derived from polyaspartic and/or polyglutamic acids, of formula



(I)

or its copolymers with other aminoacids, of formula



(II)

in which:

R and R' are side chains of aminoacids, and R' is the same or different than R;

m is an integer from 0 to 5;

p is 0, 1 or 2;

n is 1 or 2;

x is selected so that the molecular weight of the polypeptide is at least 5000 Dalton; and

x=y+z with the ratio of y/z being in the range of about 1 to about 30.03.

4,892,734

DISPENSING PASTE FOR FORMING MEDICINAL PELLETS

Robert J. Leonard, Lynnfield, Mass., assignor to Endocon, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 35,379, Apr. 6, 1987, Pat. No. 4,748,024. This application Mar. 31, 1988, Ser. No. 175,540

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—422 19 Claims

1. A process for dispensing an active ingredient and a carrier for forming pellets containing said active ingredient and said carrier comprising,

forming a paste from said active ingredient, said carrier and a liquid,

dispensing said paste,

causing said liquid to be evaporated out of said paste, leaving a dry mixture, and

forming a pellet from said dry mixture.

4,892,735

PLATINUM CHEMOTHERAPEUTIC PRODUCT

Kenneth R. Harrap, Peaslake, Nr. Guildford, England, assignor to Johnson Matthey Public Limited Company, London, England

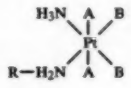
Filed Mar. 16, 1989, Ser. No. 324,054

Claims priority, application United Kingdom, Mar. 16, 1988, 8806224

Int. Cl.[4] A61E *9/02*

U.S. Cl. 424—435 10 Claims

1. A chemotherapeutic product comprising a platinum coordination compound of the general formula I,



(I)

wherein R is hydrogen, methyl, ethyl or a straight chain or branched chain or cyclic alkyl group having from 3 to 9 carbon atoms, A is a chlorine atom or hydroxyl group and is present when the platinum atom is in the Pt (IV) state, and each B is a chlorine atom or together form a malonate or substituted malonate, providing B is not chlorine when R is hydrogen, and loperamide, as a combined preparation for simultaneous, separate or sequential use in the treatment of cancer.

4,892,736

INTRA-POCKET DRUG DELIVERY DEVICES FOR TREATMENT OF PERIODONTAL DISEASES

J. Max Goodson, Cambridge, Mass., assignor to The Forsyth Dental Infirmary For Children d/b/a Forsyth Dental Center, Boston, Mass.

Continuation of Ser. No. 15,521, Feb. 13, 1987, Pat. No. 4,764,377, which is a continuation-in-part of Ser. No. 539,823, Oct. 7, 1983, abandoned. This application Jun. 3, 1988, Ser. No. 202,699

Int. Cl.[4] A61F *13/00*

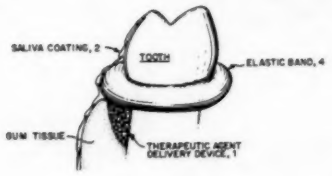
U.S. Cl. 424—435 9 Claims

1. A therapeutic agent delivery and maintenance system suitable for continuously delivering a pharmacologically-effective level of therapeutic agent to the site of a periodontal infection within a periodontal pocket and maintaining it there, comprising:

(a) therapeutic material selected from the group of therapeutic agents consisting of antibacterials, antibiotics, antiinflammatory agents, immune-suppressive agents, immune-stimulatory agents, dentinal desensitizers, odor masking agents, immune reagents, anesthetics, nutritional agents, antioxidants, lipopolysaccharide complexing agents, and peroxides;

(b) biocompatible polymeric material selected from the

group of polymers consisting of collagen, cellulosic polymers, glycolic acid polymers, methacrylate polymers, ethylene vinyl acetate copolymers, ethylene vinyl alcohol copolymers, and polycaprolactone; said polymeric material containing said therapeutic material impregnated therein and being permeable to said therapeutic material; said polymeric material being in the form of a fiber having



a diameter of 0.1 to 1 mm and being sufficiently formable and flexible to conform to the site to be treated; and

(c) means, separate from the therapeutic agent-containing polymeric material, for maintaining said therapeutic agent-containing polymeric material within said periodontal pocket in contact with the site to be treated, said maintaining means also serving to limit diffusion of said therapeutic agent from said pocket.

4,892,737

COMPOSITION AND METHOD FOR ENHANCING PERMEABILITY OF TOPICAL DRUGS

Nicholas S. Bodor, Gainesville, Fla., and Thorsteinn Loftsson, Reykjavik, Iceland, assignors to University of Florida, Gainesville, Fla.

Filed Sep. 22, 1988, Ser. No. 247,532
Int. Cl.[4] A61K *9/06, 9/22*
U.S. Cl. 424—449 **24 Claims**

1. In a composition adapted for application to the skin of a human or non-human animal and containing a bio-active agent for permeation through said skin, the improvement wherein said composition contains an amount, sufficient to enhance the permeability of said bio-active agent through said skin, of a member selected from the group consisting of (1) a choline ester having the formula:

$$[CH_3(CH_2)_n—COOCH_2CH_2N^+(CH_3)_3]X^- \text{ or}$$

$$[CH_3(CH_2)_m CH=CH(CH_2)_n—COOCH_2CH_2N^+(CH_3)_3]X^-$$

wherein m and n are integers in the range of from 0 to 30 and X— is a pharmaceutically acceptable anion and (2) a mixture of the choline ester and acid having the formula:

$$CH_3(CH_2)_n\text{-}COOH \text{ or}$$
$$CH_3(CH_2)_m CH=CH(CH_2)_n\text{-}COOH$$

or a pharmaceutically acceptable salt thereof.

4,892,738

SUSTAINED-RELEASE GRANULAR PHARMACEUTICAL PREPARATIONS

Yasushi Takagishi, Hyogo; Toshihiro Ogura, Osaka; Kenji Sasaki, Nara, and Shunji Nagata, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation of Ser. No. 442,916, Nov. 19, 1982, abandoned, which is a continuation of Ser. No. 265,595, May 20, 1982, abandoned. This application Apr. 18, 1988, Ser. No. 185,354
Claims priority, application Japan, May 21, 1980, 55-68271
Int. Cl.[4] A61K *9/22, 9/26*
U.S. Cl. 424—468 **8 Claims**

1. A pindolol sustained-release granular preparation comprising an enteric coated sustained-release component prepared by an extrusion of a moistened mass of a mixture which comprises 1–10 wt. % of pindolol, 10–50 wt. % of at least one metal salt of a C_{16}–C_{18} saturated fatty acid selected from the group consisting of magnesium stearate, calckium stearate, magnesium palmitate, calcium palmitate, aluminum stearate and aluminum palmitate, 40–55 wt. % of microcrystalline cellulose and 2–20 wt. % of at least one water soluble cellulose derivative wherein said enteric coating material is a member selected from the group consisting of cellulose acetate phthalate, hydroxypropylmethyl cellulose phthalate, a copolymer of 2-methyl-5-vinylpyridine, methyl methacrylate and methacrylic acid, and a copolymer of methyl methacrylate and methacrylic acid.

4,892,739

OSMOTIC CONTINUOUS DISPENSING ORAL DELIVERY SYSTEM CONTAINING A PHARMACEUTICALLY ACCEPTABLE ACTIVE AGENT HAVING A IMPROVED CORE MEMBRANE ADHESION PROPERTIES

Shailesh B. Shah, Union, and Arun D. Koparkar, Westfield, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,564
Int. Cl.[4] A11L *9/24*
U.S. Cl. 424—473 **11 Claims**

1. An osmotic dispensing oral delivery system containing a moderately water-soluble pharmaceutically active agent a B -blocker wherein upon activation in the gastrointestinal tract of the host, from about 60 up to about 90 percent of said active agent is delivered at a substantially continuous rate of about 5 to about 12 percent by weight of the total weight of said active agent, per hour, comprising:

(a) a semipermeable shaped wall membrane substantially impermeable to said pharmaceutically active agent and permeable to gastrointestinal fluid;

(b) a discrete layer within said wall membrane of a water-soluble or water dispersible but water permeable substantially non-osmotically active solid polymeric binder in an amount of from 0.3 to 10% by weight based on a core;

(c) said core within and defined by said discrete binder layer, said core being in the form of a solid osmotically active composition comprising about 5 to about 20 percent by weight of a tableting binder; 0 up to about 10 percent by weight of a tableting lubricant; 0 up to 80% by weight of an osmotically active driving agent; and the remainder said pharmaceutically active agent all based upon the total core composition weight; and

(d) at least one passageway in said wall in communication with said core and the external environment for dispensing said active agent into said gastrointestinal tract.

4,892,740

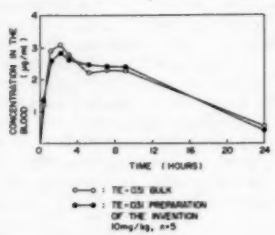
ORALLY ADMINISTRABLE PHARMACEUTICAL PREPARATION OF IMPROVED FLAVORING CHARACTERISTICS

Yasuji Takasima, Ageo; Ikuo Koyama, Hasuda; Kimihide Shimano, Ageo, and Kaoru Maezuru, Hoya, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Jan. 25, 1988, Ser. No. 147,860
Claims priority, application Japan, Jan. 3, 1987, 62-19828
Int. Cl.[4] A61K *9/28*
U.S. Cl. 424—474 **8 Claims**

1. An orally administrable pharmaceutical preparation of improved flavoring characteristics composed of a core mate-

rial containing a drug and a coating layer applied to its surface, said coating layer being composed of a particulate polymeric



substance having an average particle diameter of not more than 60 microns and being soluble in gastric juice.

4,892,741

PRESS COATED DHP TABLETS

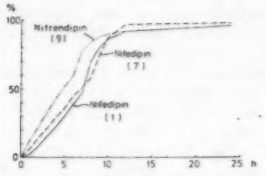
Andreas Ohm, Neuss; Helmut Lechtenberg, Niederkassel; Shinji Maegata, Oharanaka, and Wolfgang Opitz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1988, Ser. No. 204,056

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720751

Int. Cl.[4] A61K *9/36*

U.S. Cl. 424—479 **12 Claims**



1. A solid medicament preparation having a long-lasting action in the form of a press coated tablet which contains a sparingLy soluble dihydropyridine, the press coated tablet comprising

(a) a core which contains a dihydropyridine in rapid-release form, and

(b) a coat around the core, the coat containing a dihydropyridine in slow-release form.

4,892,742

CONTROLLED RELEASE COMPOSITIONS WITH ZERO ORDER RELEASE

Navnit H. Shah, Clifton, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 18, 1985, Ser. No. 799,229

Int. Cl.[4] A61K *9/36*

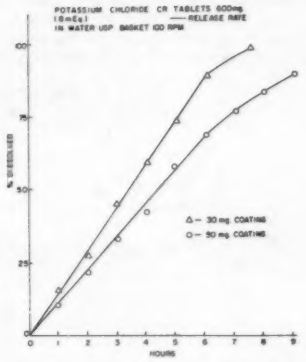
U.S. Cl. 424—480 **10 Claims**

1. A controlled release composition in table form comprising

(1) a core element comprising a 90–95% by weight of the tablet, said core comprising

(a) 65–95% by weight of a water soluble active ingredient

(b) 5–35% by weight of a water insoluble polymeric matrix; and


POTASSIUM CHLORIDE CR TABLETS 600mg (8mEq) —— RELEASE RATE
IN WATER USP BASKET 100 RPM
% RELEASED
HOURS
Δ— 30 mg. COATING
○— 50 mg. COATING

(2) a membrane coating comprising 5–10% by weight of the tablet said membrane comprising a rate controlling polymer.

4,892,743

NOVEL HYBRID INTERFERON SPECIES

Paul J. Leibowitz, Hackensack, and Michael J. Ryan, Milford, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 21, 1983, Ser. No. 564,066

Int. Cl.[4] A61K *45/02;* **C07K** *13/00, 15/26;* **C12P** *21/00*

U.S. Cl. 424—85.7 **9 Claims**

1. A protein having an amino acid sequence of 161 or 162 amino acids depending on the optional addition of methionine attached to a first amino acid in said sequence, said sequence including different portions of two different naturally occurring alpha interferons as joined discrete sub-sequences thereof defined as a delta-4 alpha-2 (Bgl II-1) sub-segment and an (Bgl II) alpha-1 segment, wherein said protein is a chain of amino acids that is not naturally occurring as an alpha interferon.

4,892,744

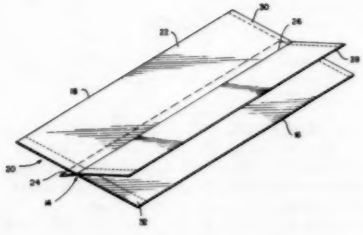
SINGLE-PLEATED MICROWAVE POPCORN PACKAGE

Jon A. Ylvisaker, Marietta, N.Y., assignor to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 13,354, Feb. 11, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,178

Int. Cl.[4] B65D *30/00, 75/12, 81/34*

U.S. Cl. 426—111 **8 Claims**



1. A backage formed from a length of microwave energy transparent sheet material, said sheet material forming said package having longitudinally extending opposed marginal edges, said package comprising two substantially planar op-

posed faces of said sheet material defining a product-containing chamber and a heat-expandable food product therein; two opposed longitudinally extending fold lines in said sheet material joining the longitudinal periphery of said opposed faces; a longitudinally-extending seam intermediate said fold lines, integral with and projecting away from said one of said face, outside the plans of said one face, said seam comprising a seal between said opposed marginal edges such that said edges are sealed to each other in face to face congruent fashion; and a longitudinally-extending pleat intermediate said fold lines, integral with and projecting away from said face opposite said one of said faces, outside the plane of said opposite face, said pleat comprising an additional fold line in said sheet material and additional opposed faces and foldable to lie against said opposite face,

said package further comprising two opposed transverse seals extending substantially along only the transverse edges of said package to seal the product contained therein, said transverse seals sealing said opposed faces to each other along said transverse edge and sealing said additional opposed faces to each other that constitute said pleat, said sheet material being otherwise unsealed between said opposed faces and said additional opposed faces and the orientation and configuration of said pleat and said transverse seals being such that when said package is placed in a microwave oven with said pleat folded against said opposite face adjacent the oven floor and microwave energy applied to the package, the expandable product will cause the expansion of said pleat creating a three-surface, generally tubular structure with sealed transverse edges each surface having one common edge with each of the other surfaces and each surface convexly curved around between the sealed transverse edges and between its common edges such that only one of said surfaces of the package contacts said oven floor and makes minimal contact between the package and the microwave oven floor thereby reducing heat transfer from said package to said floor,

at least one of said sealed transverse edges being peelable after microwave heating so that said package is openable by grasping said pleat and said seam and pulling in opposite directions so that the package opens along said peelable transverse seal.

4,892,745

TEXTURE EQUILIBRATION IN COOKIES

Dennis R. Gage, and Martin A. Mishkin, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed May 3, 1984, Ser. No. 606,727
Int. Cl.[4] A21D *13/00, 8/06*
U.S. Cl. 426—549 **3 Claims**

1. A process for accelerating texture equilibration in crumb-continuous cookies having distributed therein a discrete outer region of storage-stable crisp texture comprising sugar and starch and at least one discrete substantially enrobed inner region of storage-stable chewy texture comprising increasing the rate of sugar crystallization in the outer region of the cookie by exposing the baked cookie to an exogenous source of moisture to rehydrate the cookie surface, said sugar in said discrete outer region comprising at least about 85% sucrose by weight and said outer region having a sucrose to flour ratio of at least about 1.1:1.

4,892,746

POWDERED SOYBEAM EXTRACT

Carlos O. Donida, Rua Engenheiro Ildelfonso Simoes Lopes #40; Isolde H. Degrandi, Rua Panamericana; Raul De Moraes, Rua Joao Abbott #577/8; Nelson Magdalena, Rua Hilario Ribeiro #15/201, and Samuel Kreisner, Rua Bage #232/901, all of, Porto Alegre, Brazil

Continuation of Ser. No. 1,024, Jan. 7, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,080
Int. Cl.[4] A23L *1/20*
U.S. Cl. 426—598 **30 Claims**

10. A process for producing a solid water-soluble soybean extract, comprising:

hydrating soybeans in a first water bath to obtain hydrated soybeans;

replacing said first water bath with a second water bath;

crushing the hydrated soybeans in the presence of an additional third water bath at a temperature between about 80° C. to 90° C. to form a slurry;

thermally treating the slurry;

separating a liquid portion containing a soluble soybean extract and relatively insoluble solid portion from the slurry; and

removing the liquid from said separated liquid portion to form the solid water-soluble soybean extract.

4,892,747

LOW-CALORIE CEREAL AND PROCESS FOR PREPARING THE SAME

Atsutane Ohta, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Shibuya, Japan

Continuation-in-part of Ser. No. 65,378, Jun. 23, 1987, abandoned. This application Jul. 12, 1988, Ser. No. 219,055
Claims priority, application Japan, Jun. 30, 1986, 61-151609
Int. Cl.[4] A23L *1/10*
U.S. Cl. 426—618 **2 Claims**

1. A stabilized retort food obtained by sealing in a pack for retort a rice gruel containing granular rice with saccharide reduced more than 20% which is obtained by adding 2–10 parts by weight of water or a dilute aqueous acid heated at 60° C. or higher to 1 part by weight of boiled granular rice, warming the resulting mixture at 60° C. or higher for a period from 1 to 30 minutes while maintaining the viscosity of said water or dilute aqueous acid at 200 cP or below, removing the liquid part of the mixture from the granular rice and adding 0.5–5 parts by weight of water containing 0.1–10 parts by weight of water-soluble dietary fiber to the remaining granular rice, and sterilizing by retort.

4,892,748

LOW CALORIE PET TREAT

David A. Andersen, Long Beach, and Richard L. Harpe, Huntington Beach, both of Calif., assignors to David Platt & Associates, Woodland Hills and Wescotek, Inc., Long Beach, both of Calif.

Filed Jun. 20, 1988, Ser. No. 208,653
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—635 **4 Claims**

1. A method of making a low-calorie treat for pets, including the steps of:

providing a base having the following ingredients in the following percentages by weight:

Ingredient	Percentage Range by Weight
Water	36.0–58.0
[Protein or Carbohydrate] By-product Selected from the Group Consisting of Proteins and Carbohydrates	4.9–40.0
Methylcellulose Gum	1.0–5.0
Color	0.6–3.0
Salt	0.2–0.6

-continued

Ingredient	Percentage Range by Weight
Food grade Cellulose	20.0–32.0
Vitamins-mineral Supplement	0–0.3
Grits	0–5

heating approximately one third (⅓) of the water to about 200° F. and distributing the methylcellulose gum in the hot water;

agitating the remaining two thirds (⅔) of the water and adding this water to the distributed methylcellulose gum during such agitation at a temperature of about 70° F.;

dry blending the other ingredients; and

adding the water solution of the methylcellulose gum slowly to the dry blend under constant mixing at a temperature of about 70° F.

4,892,749

METHOD OF MANUFACTURING A REDUCED CALORIE SAUSAGE CONTAINING COOKED RICE

Gerald R. Johnson; Edward C. Jones, Jr., and Milo C. Jones, all of Fort Atkinson, Wis., assignors to Jones Dairy Farm, Fort Atkinson, Wis.

Division of Ser. No. 755,865, Jul. 17, 1985, Pat. No. 4,735,819. This application Aug. 10, 1987, Ser. No. 87,943

Int. Cl.[4] A23L *1/317*

U.S. Cl. 426—646 **4 Claims**

1. A method of forming a food product said method including the steps of

forming a particulate mixture of lean meat, fat and rice by mixing said components to form a base mixture,

grinding said meat, fat, and said rice together to form a mixture,

maintaining meat particles and rice particles of said mixture at a size generally similar to one another,

making sure said rice particles maintain their structural integrity,

blending said mixture with spices, and without adding additional fat to said mixture,

forming said mixture into a final product selected from the group including tub®s, links, both caseless and cased, patties and bulk sausage,

the particles size of the components being sufficiently small to enable the available supply of myosin to tend to form a matrix,

the fat content being no more than about 35% nor less than 4%,

the rice content being no more than about 35% nor less than 2%,

balance lean meat in an amount no more than about 90% nor less than 40%,

all in weight percent of the base mixture,

whereby a generally coarse mixture of breakfast sausage is formed in which said rice particles are generally indistinguishable from fat globules, which is suitable for forming into patties and links, and which has the texture, consistency, appearance, and taste of a high-fat breakfast sausage.

4,892,750

ELECTROSTATIC SPRAY COATING METHOD

Fujio Soshi, and Tatsuro Hamu, both of Tokyo, Japan, assignors to Taikisha Ltd., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,355

Claims priority, application Japan, Sep. 12, 1987, 62-229361

Int. Cl.[4] B05D *1/04*

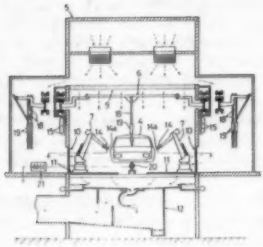
U.S. Cl. 427—27 **3 Claims**

1. An electrostatic spray coating method where an electrical field is generated in a spraying system between a spray gun and an object to be sprayed, said method comprising the steps of:

(a) grounding said spraying system;

(b) electrically insulating said object by suspending said object from a hanger rod with an insulator of a hanger conveyor type installed in a spray booth;

(c) connecting a clamping device disposed on a floor face of the spray booth to said object; and



(d) impressing a high voltage on said object by a high-voltage generator via said clamping device which transmits the voltage while clamping said object for electrostatically attracting the paint to the object for coating said object.

4,892,751

METHOD OF AND APPARATUS FOR FORMING A THIN FILM

Kiyoshi Miyake, Tsukui; Akira Shintani, Koube; Keizo Suzuki, Kodaira, and Takao Miyazaki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,358

Claims priority, application Japan, Jan. 19, 1987, 62-8027

Int. Cl.[4] B05D *1/08*

U.S. Cl. 427—34 **22 Claims**

1. A method of forming a thin film comprising the steps of:

introducing a gas near a substrate, the gas containing an element used to constitute a predetermined thin film as part of its constituent elements;

irradiating said gas with a high output power laser beam to locally produce a plasma by dissociating said gas; and

forming a thin film on said substrate by the action of reactive particles produced in said plasma.

4,892,752

METHOD OF ION IMPLANTATION

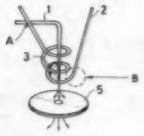
Hisashi Fukuda, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,255

Claims priority, application Japan, Aug. 12, 1987, 62-200001; Aug. 12, 1987, 62-200002; Aug. 19, 1987, 62-204254; Aug. 31, 1987, 62-215453

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **4 Claims**



1. A method of ion implantation for implanting at least one of boron ions and arsenic ions in a substrate surface, said method comprising:

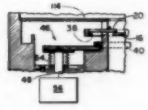
providing a four-element alloy of platinum, silicon, arsenic, and boron, a reservoir, and an emitter having a tip;
holding said four-element alloy in said reservoir in a molten state;
supplying said four-element alloy from said reservoir to said emitter;
applying a strong electric field to said tip of said emitter to extract ions from said tip of said emitter; and
implanting the extracted ions in the substrate surface.

4,892,753

PROCESS FOR PECVD OF SILICON OXIDE USING TEOS DECOMPOSITION

David N. Wang, Cupertino; John M. White, Hayward; Kam S. Law; Ciasy Leung, both of Union City; Salvador P. Umotoy, Pittsburgh; Kenneth S. Collins, San Jose; John A. Adamik, San Ramon; Ilya Perlov, Mountain View, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 944,492, Dec. 19, 1986. This application Oct. 26, 1988, Ser. No. 262,993
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **12 Claims**



1. In a process for depositing silicon dioxide onto a substrate by exposing the substrate to plasma formed from a gas mixture which includes tetraethylorthosilicate, the steps of: positioning the substrate on a support within a vacuum chamber and adjacent a gas manifold which is an RF electrode and includes a multiplicity of closely-spaced gas outlet holes closely adjacent the substrate; and communicating the gas mixture into the manifold while applying RF energy between the manifold and the substrate support and maintaining the total pressure in the chamber within the range of about 1 to 50 torr and the temperature of the substrate in the range of about 200° C. to 500° C.

4,892,754

PROCESS FOR PREPARATION OF WATER ABSORPTIVE COMPOSITE MATERIAL

Kiichi Itoh, and Takeshi Shibano, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo and Uni-Charm Corporation, Kawanoe, both of, Japan

Filed Apr. 15, 1988, Ser. No. 182,194
Claims priority, application Japan, Apr. 17, 1987, 62-94465
Int. Cl.[4] B05D *3/06, 3/02;* B32B *27/00*
U.S. Cl. 427—54.1 **12 Claims**

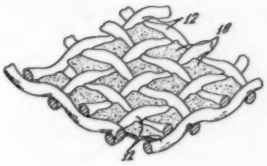
1. A process for preparing a water absorptive composite material, which comprises the combination of the following steps of:
(A) applying an aqueous solution of polymerizable monomers comprising as a main component acrylic acid, of which 20% or more of the carboxyl groups have been neutralized to its alkali metal salt or ammonium salt, to a prefabricated fibrous substrate;
(B) polymerizing the polymerizable monomers applied to said fibrous substrate to form a composite of a polymer derived from said polymerizable monomer and said fibrous substrate; and
(C) irradiating ultraviolet rays onto said composite with its water content being 0.01 to 40 parts by weight per 1 part by weight of said polymer to obtain a water absorptive composite having a lower content of unpolymerized monomers than said composite.

4,892,755

REFRACTORY COMPOSITE ARTICLES AND METHOD OF MAKING SUCH ARTICLES

David A. Eitman, Huntington Beach, Calif., assignor to Science Applications International Corporation, San Diego, Calif.

Division of Ser. No. 793,706, Oct. 31, 1985, Pat. No. 4,735,850. This application Dec. 7, 1987, Ser. No. 129,224
Int. Cl.[4] B05D *1/36*
U.S. Cl. 427—203 **21 Claims**



1. A method of forming a refractory composite material, including the steps of:
providing a plurality of fibers in a porous relationship to form a substrate, the fibers having a particular thickness,
disposing particles of a pyrolyzed material on the substrate, and
mechanically locking in the pores of the fibers particles of a mixture formed from a first material having properties of oxidizing and having a low oxide melting temperature, a second material having properties of oxidizing and having a higher oxide melting temperature than the oxide of the first material and a refractory material having properties of oxidizing and having considerably higher oxide melting temperature than the oxides of the first and second materials, the particles of the mixture having a size in the same order of magnitude as the particular thickness, the oxide of the first material being non-viscous, the oxide of the second material being more viscous than the first material and the oxide of the third material being considerably more viscous than the first and second materials.

4,892,756

FLOCK ADHESIVE COMPOSITION

Patrick A. Warren, Erie; Robert A. Auerbach, Williamsport, and Eugene L. Polaski, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Division of Ser. No. 203,795, Jun. 6, 1988, Pat. No. 4,835,226. This application Mar. 20, 1989, Ser. No. 326,215
Int. Cl.[4] C08G *18/58*
U.S. Cl. 427—206 **5 Claims**

1. In the preparation of flocked rubber articles wherein flocks of staple fibers are fixed to the surface of a rubber substrate through an adhesive layer, the improvement comprising employing as the adhesive layer the adhesive composition comprising:
A. about 1 to 20% by weight of an aromatic nitroso compound;
B. about 1 to 20% by weight of an epoxy resin having an epoxy equivalent of at least one; and
C. about 60 to 98% by weight of a blocked isocyanate-functional urethane prepolymer, the isocyanate group or

groups of said prepolymer being blocked with a blocking agent comprising a substituted or unsubstituted phenol.

4,892,757

METHOD FOR A PRODUCING MANGANESE ACTIVATED ZINC SILICATE PHOSPHOR

Anthony F. Kasenga, Towanda, Pa.; Leslie F. Gray, Waverly, N.Y.; Thomas L. Henson, and MacInnis, Martin B., both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,659
Int. Cl.[4] C09K *11/59*
U.S. Cl. 427—215 8 Claims

1. A method for reproducibly producing manganese activated zinc silicate phosphor particles, said method comprising:

(a) dry blending a mixture of components consisting essentially of zinc oxide, silicic acid, a source of manganese, ammonium chloride, ammonium fluoride, and silica, and having a Zn+Mn /Si mole ratio of from about 1.95 to about 2.02 wherein said silica is colloidal and has a surface area of from about 50 to about 410 m^2 per gram and wherein said colloidal silica makes up from about 0.01% to about 1.0% by weight of said mixture; and

(b) firing the resultig dry blend of components in a nitrogen atmosphere at a temperature of from about 1200° C. to about 1300° C. for a sufficient time to produce said phosphor particles wherein said phosphor particles exhibit reproducible brightness.

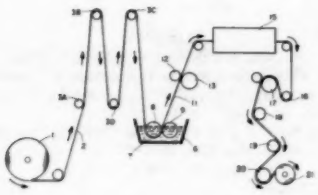
6. A method according to claim 1 comprising the additional step of coating said phosphor particles with a continuous coating of aluminum oxide to form manganese activated zinc silicate phosphor particles having a continuous coating of aluminum oxide thereon said coated phosphor particles having improved maintenance over said phosphor particles produced absent said coating.

4,892,758

CLEANING PRODUCT

Paul J. Serbiak, Green Bay, Wis.; Edwin G. Greenman, Woodstock, Ga., and Gary L. Shanklin, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 236,952, Aug. 26, 1988, abandoned, which is a division of Ser. No. 920,494, Oct. 17, 1980, Pat. No. 4,793,941.
This application Apr. 7, 1989, Ser. No. 334,826
Int. Cl.[4] B05D *1/16, 3/12*
U.S. Cl. 427—242 3 Claims



1. A method for making a cleaning product comprising:

(a) continuously passing a meltblown web through a container containing liquid detergent, wherein the web is submersed in the liquid detergent and saturated therewith;

(b) passing the saturated web through a nip to squeeze out excess liquid detergent;

(c) drying the web to remove substantially all of the available moisture; and

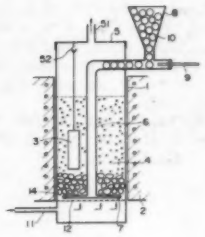
(d) converting the web into individual sheets.

4,892,759

METHOD FOR SURFACE TREATMENT

Tohru Arai, 9-3, Yashiro, Misaki-cho, Toyoake-shi, Aichi-ken; Hiromasa Takeda, Narumi-Shataku 422, 84-1, Aza Otokoyama, Narumi-cho, Midori-ku, Nagoya-shi, Aichi-ken, and Hiroyuki Kawaura, Nagakute-ryo 314, 41-3, Aza Yokomichi, Oaza Nagakute, Nagakute-cho, Aichi-gun, Aichi-ken, all of Japan

Filed Aug. 5, 1988, Ser. No. 228,423
Claims priority, application Japan, Aug. 12, 1987, 62-201330
Int. Cl.[4] C23C *16/44;* B05D *1/22*
U.S. Cl. 427—249 18 Claims



1. A method for forming, on a material to be treated, a surface layer of a carbide, nitride or carbonitride, or a mixture thereof, or a solid solution thereof, which method comprises:

disposing in a fluidized bed furnace a mass of particles of a layer-forming agent, containing at least one element for forming the surface layer, below and/or at the side of the material to be treated in a manner not to contact said material to be treated;

disposing in said fluidized bed furnace a powder of alumina or other refractory material as a fluidizing agent for forming a fluidized bed;

introducing a fluidizing gas into the fluidized bed furnace to fluidize said powder of alumina or other refractory material and to form a fluidized bed;

disposing said material to be treated in said fluidized bed; and

introducing from outside the fluidized bed furnace a halide as an activator for said layer-forming agent into said furnace below said layer-forming agent,

thereby forming under heating a layer of a carbide, nitride or carbonitride, or a mixture thereof, or a solid solution thereof on the surface of the material to be treated.

4,892,760

APPARATUS FOR SIMULTANEOUSLY COATING A PLURALITY OF SURFACE TYPE FASTENER TAPES OR LIKE STRIPS

Hisai Nishiyama, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 195,025, May 17, 1988, abandoned, which is a division of Ser. No. 928,480, Nov. 10, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 279,109
Claims priority, application Japan, Nov. 11, 1985, 60-172334
Int. Cl.[4] B05D *1/28;* B05C *1/08*
U.S. Cl. 427—428 7 Claims

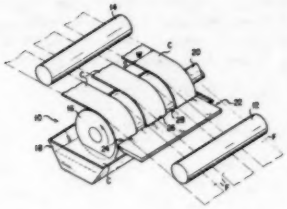
1. A method for simultaneously applying a coating substance to a plurality of elongated tapes each of a known width which comprises:

moving said tapes in uniformly spaced relation along a predetermined path in parallel spaced relation;

applying a layer of coating subatance uniformly across the surface of a coating roller,

contacting said layer while on said roller with a doctor blade having scraping edges registering with the spacings be-

tween said tapes and recesses between said scraping edges equal to the widths of said tapes, and



removing coating substance from said roller with said scraping edges while depositing coating substances on said moving tapes limited to the widths of said tapes.

4,892,761

SURFACE TREATMENT METHOD AND APPARATUS THEREFOR

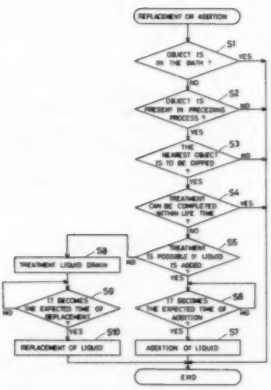
Takuma Yamada, Moriyama, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 906,401, Sep. 9, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,863

Claims priority, application Japan, Oct. 1, 1985, 60-219868

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—430.1 **4 Claims**



1. A surface treatment method for transporting a number of objects which are to be subjected to different series of treatment steps in a treatment bath train containing a plurality of treatment baths and serially dipping each of said objects in selected treatment liquids supplied in said treatment baths, for predetermined times respectively, each of said objects being serially dipped in said selected treatment liquids in a dipping order which is previously determined according to a treatment program for each of said objects individually, said surface treatment method comprising the steps of:

determining a reference clock time at which a particular one of said objects is actually brought into said treatment bath train;

calculating for a particular one of said treatment baths an expected clock time at which said particular object is expected to arrive at said particular treatment bath on the basis of said reference clock time and a predetermined length of time that elapses for said particular object to be treated in at least one preceding treatment bath in said dipping order before said particular object arrives at said particular treatment bath, said expected clock time being calculated before said particular object arrives at said one treatment bath; and

transporting said particular object along said treatment bath train and serially dipping said particular object in said treatment liquids in said treatment baths while controlling a characteristic of each of said treatment liquids on the basis of said expected clock time through the steps of

(a) calculating a lifetime terminating clock time after which a known lifetime of said treatment liquid currently available in said particular treatment bath is expected to be over,

(b) comparing said lifetime terminating clock time with said expected clock time,

(c) counting a number of dippings indicating how many of said objects have been dipped in said treatment liquid currently available in said particular treatment bath,

(d) comparing said number of dippings with a known allowed dipping number indicating how many more of said objects can be effectively treated by said treatment liquid currently available in said particular treatment bath without replacement of at least a portion thereof,

(e) determining on the basis of said steps (b) and (d) whether said lifetime terminating clock time will be over, and whether said number of dippings will exceed said allowed dipping number, if said particular object is dipped in said treatment liquid currently available in said particular treatment bath, and

(f) replacing at least a portion of said treatment liquid in said treatment bath in accordance with the determination made in said step (e).

4,892,762

REDUCED CALORIE HIGH FIBER BREAD CONTAINING A TREATED SOY POLYSACCHARIDE MATERIAL

Abdelrahman A. Abdelrahman, St. Louis, Mo., assignor to Continental Baking Company, Del.

Filed May 12, 1988, Ser. No. 192,971

Int. Cl.[4] A21D *8/02, 13/04*

U.S. Cl. 426—549 **17 Claims**

1. A process for the treatment of a soy polysaccharide material to provide improved functionality as an ingredient for a baked product comprising:

(a) hydrating a soy polysaccharide material at a weight ratio of soy polysaccharide material to water of about 1:0.5 to 1:4;

(b) heating said hydrated material for a temperature and time sufficient to improve the specific volume (cc/gm) of the baked product in which the material is used as an ingredient and as compared to the use of an untreated soy polysaccharide material.

4,892,763

BOTTLE GRADE POLYESTER RESINS REINFORCED WITH GLASS FIBERS AND CONTAINERS MADE OF SUCH RESINS

Diego Duse, Via Osmano, n. 1, 24100 Bergamo, B.G., Italy

Filed Jan. 16, 1985, Ser. No. 692,355

Claims priority, application United Kingdom, May 1, 1984, 8411095

Int. Cl.[4] B27N *5/02*

U.S. Cl. 428—34.1 **17 Claims**

9. A container as set forth in claim 1 or 2, wherein said container is molded by injection stretch-blow molding.

4,892,764

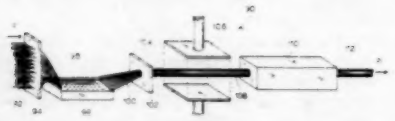
FIBER/RESIN COMPOSITES, AND METHOD OF MAKING THE SAME

Kieran F. Drain, Rochester Hills, Mich.; Larry A. Nativi, Rocky Hill, and Richard T. Thompson, Haddam, both of Conn., assignors to Loctite Corporation, Conn.

Continuation-in-part of Ser. No. 104,885, Aug. 19, 1987, which is a continuation-in-part of Ser. No. 882,670, Jul. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 801,984, Nov. 26, 1985. This application Oct. 16, 1987, Ser. No. 109,675

Int. Cl.[4] B29C *35/10, 71/04;* **B32B** *1/08, 1/10, 31/28;* **B65H** *81/00*

U.S. Cl. 428—34.5 **16 Claims**



1. A fiber/resin composite comprising a resin having fiber(s) associated therewith, said resin comprising a first resin component cured by actinic radiation and a second, ambient temperature curable resin component which is non-curable under actinic radiation conditions curingly effective for the first resin component, wherein the actinic radiation cured component is present in an immobilizingly effective amount for the composition prior to curing of the second resin component.

4,892,765

HEAT-SHRINKABLE LAMINATE FILM AND PROCESS TO PRODUCE THE SAME

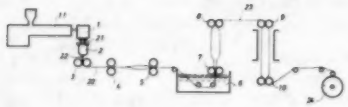
Nobuyuki Hisazumi, Tsuchiura; Keisuke Kahara, and Yoshihiro Matsukura, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1987, Ser. No. 53,404

Claims priority, application Japan, May 23, 1986, 61-118724

Int. Cl.[4] A22C *13/00*

U.S. Cl. 428—34.8 **8 Claims**



1. A heat-shrinkable laminate film consisting of a core layer of a copolymer of vinylidene chloride, two surface layers of a polyamide and a modified copolymer obtained by grafting a copolymer of ethylene and a vinyl carboxylate or an acrylic ester with an ethylenically unsaturated carboxylic acid or an acid anhydride thereof, a polymeric material obtained by neutralizing said modified copolymer with a metallic compound and a thermoplastic polyurethane as an adhesive layer between each one of said two surface layers and said core layer, and showing the rate of shrinkage of not less than 10% both lengthwise and breadthwise after keeping said film 3 seconds in an atmosphere of 90° C, the rate of delayed recovery of not more than 2% in room temperature and the rate of creep of not more than 20% after immersing said film 10 seconds into a warm water of 80° C with a load of 1 kg/mm^2, produced by coextruding the copolymer of vinylidene chloride, the polyamide and the adhesive to form a coextruded laminate film and rapidly cooling the thus coextruded laminate film to a temperature of lower than the second order transition point of one of the polyamides, which is lower, but not lower than 30° C below the lower transition point, thereby making said copolymer of vinylidene chloride into an amorphous state and making said polyamide of said two surface layers absorb water so that the rate of absorption of water is from 1 to 5% by weight, biaxially stretching the thus rapidly cooled film at a temperature of from 60 to 100° C, and thereafter, subjecting the thus biaxially stretched film to heat-treatment for not shorter than 2 seconds at a temperature of from 70 to 100° C while making said polymide of the outer surface layer absorb water from 2 to 7% by weight, thereby making said biaxially stretched film shrink from 1 to 15% both lengthwise and breadthwise.

4,892,766

CAPSULES

Brian E. Jones, Basingstoke, England, assignor to Lilly Industries Limited, Basingstoke, England

Filed Sep. 8, 1988, Ser. No. 241,647

Claims priority, application United Kingdom, Sep. 11, 1987, 8721455

Int. Cl.[4] A61K *9/48*

U.S. Cl. 428—36.4 **12 Claims**

1. A two-piece hard capsule shell having improved embrittlement properties comprising an admixture of gelatin and a pharmaceutically or veterinary acceptable hydrophilic fibrous material, wherein the fibres in the fibrous material have lengths of up to about 1000 microns.

4,892,767

SCREENING ARRANGEMENT

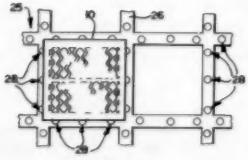
Manfred F. A. Freissle, Birkenweg, Fed. Rep. of Germany, assignor to Screenex Wire Weaving Manufacturers (Proprietary) Limited, Alberton, South Africa

Filed Dec. 15, 1988, Ser. No. 284,934

Claims priority, application South Africa, Sep. 29, 1988, 88/7318

Int. Cl.[4] B32B *3/12*

U.S. Cl. 428—52 **10 Claims**



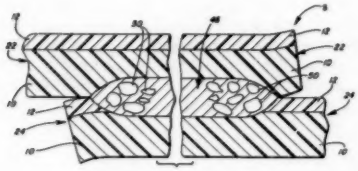
1. A screening element for screening a load of material and which is predominately of a synthetic plastics material and which has a screening surface formed by a plurality of ribs extending across the element, the ribs each being of a zig-zag configuration and the ribs being spaced from each other to define between them screening apertures, portions of adjacent ribs being closely spaced from and opposed to each other but not abutting against each other and other portions of adjacent ribs being further spaced from and opposed to each other so that the screening apertures defined between the ribs have alternate wide and narrow regions, the ribs being resiliently deformable independently of each other under the load of material to be screened and the ribs tending to straighten during deformation under the load.

4,892,768

THERMOPLASTIC STRAP WITH MULTIPLE MATERIAL STRUCTURE AND WELD PRODUCED THEREWITH

Nelson Cheung, Hoffman Estates; Russell J. Gould, Mt. Prospect, and Manuel C. Enriquez, Morton Grove, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 871,693, Jun. 6, 1986, Pat. No. 4,776,905. This application Apr. 19, 1988, Ser. No. 183,072
The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.
Int. Cl.[4] B32B 5/18
U.S. Cl. 428—57 8 Claims



1. A welded joint between two overlapping portions of thermoplastic strap arranged in a face-to-face relationship at said welded joint wherein said strap includes a first material defining a layer and a second material carried by said first material with said second material including a non-atmospheric, non-aqueous, particulate foaming agent which foams as a result of application of heat, said welded joint comprising:

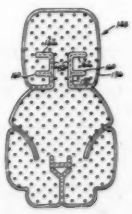
at least part of the thickness of each said strap portion forming a resolidified region from a fused state after application of heat to said strap portions in an initial solid state, said resolidified region containing a plurality of cavities at least adjacent each end of said resolidified region, said cavities being defined by the encapsulation of the foam resulting from said foaming agent during application of the heat of welding.

4,892,769

FIRE RESISTANT THERMOPLASTIC MATERIAL CONTAINING ABSORBENT ARTICLE

Lee E. Perdelwitz, Jr., Tacoma; Paul G. Gaddis, Renton; Ron H. Iff, Puyallup; Michael E. Cotie, Tacoma, and Amar N. Neogi, Seattle, all of, assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 29, 1988, Ser. No. 188,309
Int. Cl.[4] B32B 1/04
U.S. Cl. 428—68 32 Claims



1. A fire resistant infant seat liner having a lower leg supporting section, a central seat supporting section and an upper body supporting section, the infant seat liner comprising a thermobonded mixture of thermoplastic and natural fibers, the thermobonded mixture including a fire resistant material in the amount sufficient to increase the fire resistance of the thermobonded mixture above the fire resistance of the thermobonded mixture without the fire resistant material, the infant seat liner having a flame propagation rate of no greater than 4.5 lineal inches per minute.

4,892,770

INTERIOR TRIM FOAM PRODUCT AND METHOD OF FABRICATION THEREOF

Craig B. Labrie, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Division of Ser. No. 230,572, Aug. 10, 1988, Pat. No. 4,839,118. This application Mar. 20, 1989, Ser. No. 325,446
Int. Cl.[4] B32B 3/06, 5/28
U.S. Cl. 428—71 2 Claims

1. A vehicle interior trim component comprising an outer shell of flexible material having a raw edge formed continuously around the periphery thereof; a mold insert located in spaced relationship to said flexible shell including an inboard located peripheral edge thereon located in spaced relationship to the continuously formed peripheral raw edge of said shell; said insert being located in spaced relationship to said shell to form a cavity therebetween; foam material filling said cavity and the space between said raw edge and inboard periphery of said insert; and a heat post formed outer flange on said insert located in overlying relationship to the outer surface of the shell to form a finished surface around the full periphery of both the shell and the insert whereby the insert is connected to the shell to form an exposed back on the shell for supporting both it and the foam material.

4,892,771

THERMAL INSULATION BLANKET FOR A HOT WATER HEATER

David F. Rowland, 1148 Meadowcroft La., Mt. Pleasant, S.C. 29464

Filed Apr. 1, 1988, Ser. No. 176,465
Int. Cl.[4] B32B 1/04
U.S. Cl. 428—74 3 Claims

1. A thermal insulation blanket for a hot water heater, comprising a fiberglass insulative material sandwiched between a first and a second layer of woven polyethylene, with said first layer of woven polyethylene attached to said second layer of woven polyethylene along all edges thereof, by sewing said edges together so as to eliminate air pockets or other gaps between said first layer and said second layer and within said insulative material, and so as to prevent said insulative material from being compressed by said first and said second layer, wherein the height of the blanket is slightly higher than the height of a hot water heater to be covered and the length of

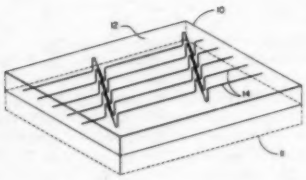
said blanket is approximately equal to the circumference of said water heater to be covered, wherein a means is provided for joining an edge of said blanket which meets an opposite edge of said blanket when the blanket is wrapped around said hot water heater along the length of said edge and said opposite edge, and wherein a line is provided through a top edge of said blanket to allow said edge to be pulled tightly against said water heater.

4,892,772

FIBER REINFORCED RESIN SHEETS

Kwai-Yung B. Su, Hockessin, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1988, Ser. No. 271,152
Int. Cl.[4] B51B 5/12
U.S. Cl. 428—113 12 Claims



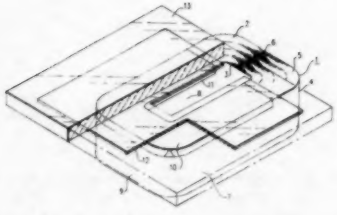
1. A composite structure for forming into a shaped article comprising a sheet of matrix resin reinforced with a unidirectional array of fiber lengths, each of said fiber lengths having alternating straight length and excess length sections.

4,892,773

PREPARATION OF AMORPHOUS METAL CORE FOR USE IN TRANSFORMER

Terrence E. Chenoweth, Watkinsville; Eugenius S. Hammack, Athens, both of Ga., and Wallace L. McDonald, Sandy Springs, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1987, Ser. No. 79,854
Int. Cl.[4] B32B 3/04
U.S. Cl. 428—121 14 Claims



1. An amorphous metal core having an adhesive impregnated substrate of woven cloth or matted material selected from the group consisting of glass, polyesters, polyimides, polyamides and mixture thereof that is impregnated with a curable adhesive comprising a thixotrope bonded to at least a portion of each edge, where said substrate extends beyond said edge, is bent over said edge, and is bonded to said core.

4,892,774

INTERLEAFED FIBER-REINFORCED THERMOPLASTIC COMPOSITE

Michael A. Vallance, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 7, 1988, Ser. No. 141,708
Int. Cl.[4] B32B 27/08, 27/12, 31/12
U.S. Cl. 428—174 38 Claims

1. An interleafed fiber-reinforced thermoplastic composite comprising:

(1) at least one fiber-reinforced layer comprising reinforcing filaments coated with at least one thermoplastic binder resin, and on at least one surface of said fiber-reinforced layer,

(2) at least one interleaf layer comprising a block copolymer resin comprising polymer segments of

(a) at least one thermoplastic resin co-crystallizable or co-vitrifiable with said binder resin, and

(b) at least one co-resin having a glass transition temperature substantially lower than said segment (a).

4,892,775

JET INK FOR VINYL SUBSTRATE MARKING

Il H. Song, Glen Ellyn, Ill., assignor to Videojet Systems International, Inc., Elk Grove Village, Ill.

Division of Ser. No. 113,792, Oct. 27, 1987, Pat. No. 4,834,797.
This application Jan. 4, 1989, Ser. No. 293,369
Int. Cl.[4] B32B 9/00
U.S. Cl. 428—195 2 Claims

1. A plasticized vinyl article comprising

(a) a vinyl layer which contains a vinyl polymer and at least one plasticizer for said polymer; and

(b) images printed on said layer by non-contact, ink jet application of an ink having a composition comprising an acrylic resin binder component having pendant amino groups, said binder being soluble in, and dissolved by, a mixture of a lower alkanol and a lower ketone; a carrier comprising a lower alkanol and a lower ketone in which the acrylic resin binder is soluble; and a dye which is soluble or dispersible in said carrier; the images being stable against degradation by the plasticizer contained in said vinyl coating.

4,892,776

CIRCUIT BOARD MATERIAL AND ELECTROPLATING BATH FOR THE PRODUCTION THEREOF

James H. Rice, Sylmar, Calif., assignor to Ohmega Electronics, Inc., Culver City, Calif.

Filed Sep. 2, 1987, Ser. No. 91,990
Int. Cl.[4] B32B 9/00
U.S. Cl. 428—209 19 Claims

1. A circuit board material comprising:

a support layer;

at least one electrical resistance layer adhered to the support layer, the resistance layer having a nickel phosphorous composition; and

a conductive layer adhered to the resistance material layer, the conductive layer having an activating agent applied thereto before the resistance layer is eeposited onto the conductive layer, wherein the resistance layer of the circuit board material has an electrical resistance of at least 500 ohms per square.

4,892,777

FINE-GRAINED COATED LAMINATE IN CONTINUOUS WEB FORM

Hanns J. Wald, Waldmichelbach; Wilfried Getrost, Mölenbach, and Sigrid Lang, Birkenau, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr, Fed. Rep. of Germany

Filed Apr. 6, 1989, Ser. No. 334,602

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3812948

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—212 8 Claims

1. A coated laminate material in web form, with leather-like appearance and fine-grained surface and a thickness of 0.7 to 5.0 mm, consisting of an 0.03 to 0.4 mm thick, soft PVC, polyurethane, NBR, SBR or acrylate coating, an adhesive coating, and an 0.2 to 3.5 mm thick supporting layer having a specific weight of 30 to 500 g/m^2 of nonwoven fabric, or of a woven fabric impregnated with acrylate dispersion, wherein, between the supporting layer and the coating, a smooth-textured knitted fabric having a specific weight of 30 to 200 gm/m^2 or a smooth-textured woven fabric having a specific weight of 100 to 500 gm/m^2 is placed, consisting of polyester, polyamide, or cotton fibers or mixtures thereof, this intermediate layer being surrounded on both sides by a soft polymer layer joining the supporting layer to this intermediate layer, and the laminate material in the embedded state having an elongation at rupture of at least 8%.

4,892,778

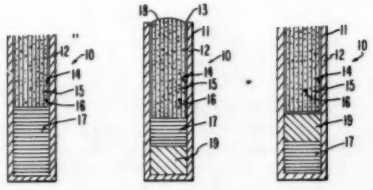
JUXTAPOSED LAMINATED ARRANGEMENT

Felix Theeuwes, Los Altos; Patrick S. L. Wong, Hayward; Richard Cortese, and James B. Eckenhoff, both of Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 27, 1987, Ser. No. 54,714

Int. Cl.[4] A61K *9/22*; B32B *7/02*

U.S. Cl. 428—218 6 Claims



1. A juxtaposed laminated arrangement useful for manufacturing a dispenser, which laminate when disposed in the dispenser and the dispenser is in operation administers a beneficial agent to a biological fluid environment of use, wherein the laminated arrangement comprises: a first lamina means for changing from an initial physical state when inside the dispenser to a different physical state when outside the dispenser, which first lamina comprises the beneficial agent and transports the beneficial agent from the dispenser to the biological environment; and, a second lamina means for consuming space inside the dispenser, which second lamina comprises a hydrophilic composition that on contact with fluid from the environment that enters the dispenser absorbs the fluid and thereby exhibits a 2 to 50 fold volume increase for consuming space.

4,892,779

MULTILAYER ARTICLE OF MICROPOROUS AND SUBSTANTIALLY NONPOROUS MATERIALS

Dennis D. Leatherman, Pittsburgh, Pa., and Richard A. Schwarz, Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 169,654, Mar. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 138,980, Dec. 29, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,584

Int. Cl.[4] B32B *3/26, 5/22*

U.S. Cl. 428—220 31 Claims

1. A multilayer article comprising material which is impervious to the passage of gas and bacteria fusion bonded in the absence of extrinsic intervening adhesive to microporous material comprising:

(a) a matrix consisting essentially of essentially linear ultrahigh molecular weight polyolefin which is essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least about 18 deciliters/gram, essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least about 6 deciliters/gram, or a mixture thereof.

(b) finely divided particulate substantially water-insoluble siliceous filler distributed throughout said matrix, said filler constituting from about 50 percent to about 90 percent by weight of said microporous material, and

(c) a network of interconnecting pores communicating throughout said microporous material, said pores before fusion bonding constituting at least about 35 percent by volume of said microporous material.

4,892,780

FIBER REINFORCEMENT FOR RESIN COMPOSITES

William H. Cochran, 1 Williams St., P.O. Box 32, Stonington, Conn. 06378, and Brian P. Doyle, 3 Clifton Rd., Natick, Mass. 01760

Filed Jul. 16, 1987, Ser. No. 74,170

Int. Cl.[4] B32B *5/02*

U.S. Cl. 428—234 9 Claims

1. A resin-impregnated fiber composite comprising a laminate of fibrous substrates each having staple fiber applied to one or both sides by mechanical entanglement, the substrates being impregnated with resin and the laminate being cured whereby the composite is characterized by improved interlaminar shear strength through the interlocking effect of the staple fibers applied by mechanical entanglement.

4,892,781

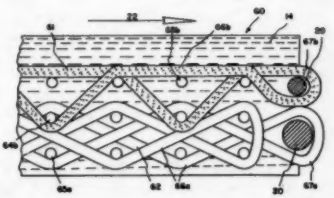
BASE FABRIC STRUCTURES FOR SEAMED WET PRESS FELTS

Patrick H. Penven, Clinton, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Division of Ser. No. 108,491, Oct. 14, 1987, Pat. No. 4,824,525. This application Mar. 3, 1989, Ser. No. 318,727

Int. Cl.[4] B32B *5/02*

U.S. Cl. 428—234 4 Claims



1. A papermaker's wet press felt which is rendered endless

by intermeshing seaming loops, extending from respective ends of a base fabric of said felt, and inserting a pintle in the resulting channel formed by the loops, said felt comprising:

(a) the base fabric being a multi-ply fabric which was flat woven in a selected repeat pattern with crimped warp yarns oriented lengthwise in the loom and further oriented in the felt running direction during use on the papermaking machine;

(b) said crimped warp yarns being woven at least 60 to 100 yarns per inch;

(c) each of said seaming loops, at the respective ends of said felt, being a portion of a selected one of said crimped warp yarns of said base fabric which extends beyond the respective end of said woven base fabric and is retained in said base fabric by said selected repeat pattern, said seaming loops extending in the lengthwise or felt running direction when said loops are intermeshed at the seam; and

(d) at least one layer of batt material affixed to said base fabric.

4,892,782

FIBROUS MICROWAVE SUSCEPTOR PACKAGING MATERIAL

John R. Fisher, Hockessin, Del., and Hua-Feng Huang, Mendenhall, Pa., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Apr. 13, 1987, Ser. No. 37,987
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—240 **15 Claims**

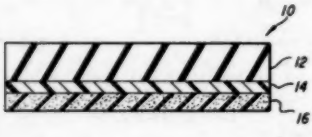
1. A composite material for wrapping around a food item to be cooked in a microwave oven comprising a drapable, liquid permeable, woven or non-woven, fibrous, dielectric substrate, which substrate, or fibers of which substrate, are coated and/or imbibed with one or more microwave susceptor materials, the amount of said susceptor materials being sufficient to generate adequate heat to rapidly brown or crispen the surface of food item adjacent thereto without substantially impeding the ability of the microwave energy to penetrate the susceptor material and cook the food item, said composite material being liquid permeable.

4,892,783

TRI-ELEMENT CARBON BASED HEAT SHIELD

James P. Brazel, Berwyn, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 10, 1988, Ser. No. 269,467
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—282 **18 Claims**



1. A heat shield comprising:

layer including a carbonaceous material, the outer layer having a first thermal diffusivity, an outer surface, an inner surface and a thickness disposed between the outer and inner surface, the outer surface for operating at a predetermined expected maximum temperature;

a middle layer including pyrolytic graphite, the middle layer deposited on the inner surface of the outer layer, the middle layer having a second thermal diffusivity, an inner surface and a thickness disposed between the inner surface of the outer layer and the inner surface of the middle layer; and

an inner layer including a compliant material having an outer surface for abutting the inner surface of the middle layer, the inner layer having a third thermal diffusivity, an inner surface and a thickness disposed between the outer and inner surface, wherein the operational temperature at the inner surface of the inner layer is less than a protective limit temperature when the outer surface of the outer layer is at the predetermined expected maximum temperature.

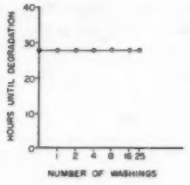
10. The heat shield as in claim 1, wherein the compliant material includes a carbon felt.

4,892,784

SURFACE TREATMENT FOR INHIBITING THERMAL OXIDATION OF POLYPROPYLENE FABRICS

William G. Reeves, Woodstock; Robert J. Roeder, Roswell, and Leonard E. Duello, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 27, 1988, Ser. No. 224,835
Int. Cl.[4] B05D *1/18, 3/02;* **D04H** *1/58*
U.S. Cl. 428—288 **20 Claims**



1. A process for inhibiting thermal oxidation of polypropylene fabrics comprising the steps of:

preparing an aqueous solution having a concentration of greater than about 5 ppm of dilaurylthiodipropionate;

heating the aqueous solution to at least 150 degrees F.;

saturating the polypropylene fabric with the heated aqueous solution; and allowing the fabric to dry to substantially remove the water therefrom.

5. The polypropylene fabric formed from the process of claim 1.

4,892,785

HEAT RESISTANT BINDERS

Ronald Pangrazi, Somerville, and James L. Walker, Whitehouse Station, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 912,747, Sep. 26, 1986, Pat. No. 4,859,508. This application Apr. 10, 1989, Ser. No. 335,360
Int. Cl.[4] B05D *1/38;* **B32B** *11/04, 27/08, 27/30*
U.S. Cl. 428—288 **10 Claims**

1. A roofing membrane comprising a polyester mat impregnated with an emulsion polymer having a glass transition temperature (Tg) of +10° to +50° C., the polymer comprising 100 parts by weight of acrylate or styrene/acrylate monomers, 3 to 6 parts of a blocked, N-methylol containing comonomer selected from the group consisting of N-(isobutoxymethyl)acrylamide, N-(iso-propoxymethyl)acrylamide and N-(propoxymethyl)acrylamide; 0 to 3 parts of a water soluble nonblocked N-methylol containing comonomer and 0 to 5 parts of a multifunctional comonomer; the impregnated mat being coated with asphalt.

4,892,786

CERAMIC ARTICLES WITH A POLYMER COMPONENT AND METHODS OF MAKING SAME

Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 908,054, Sep. 16, 1986, abandoned. This application Jun. 26, 1987, Ser. No. 67,522

Int. Cl.[4] B32B *3/06*; B05D *5/00*; B22F *7/04*

U.S. Cl. 428—307.3 18 Claims

10. A self-supporting ceramic body which comprises: a polycrystalline oxidation reaction product formed upon oxidation of a molten parent metal with an oxidant, and possessing interconnected porosity at least partially accessible from at least one surface of said ceramic body; and a polymer disposed in at least a portion of said porosity.

4,892,787

COATED PAPER FOR INK JET PRINTING

Jurgen M. Kruse, and Donald Kimball, both of Clinton, Conn., assignors to AM International, Inc., Chicago, Ill.

Filed Aug. 10, 1987, Ser. No. 83,276

Int. Cl.[4] D21H *1/38*; B32B *23/08*

U.S. Cl. 428—331 23 Claims

1. A coated substrate useful in ink jet printing, comprising:

(a) a cellulosic substrate defining at least one surface coated with

(b) a coating comprising an intimate mixture of

(1) particulate dye-sorptive pigment having a surface area of at least 100 m^2/g and an average particle size of less than about 8 μm in an amount sufficient to provide a desired rate of dye sorption; and,

(2) a binder comprising a mixture of an acrylic resin and polyvinyl alcohol in respective amounts effective to minimize or eliminate chalking of said pigment and to sorb solvent from water- or glycol-based jet printing ink applied to said coating to form round dots from droplets of said ink provided to said coating by an ink jet printer.

4,892,788

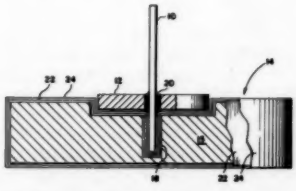
GRAPHITE BRAZING FIXTURE COATED WITH COMPOSITE LAYERS OF TITANIUM CARBIDE AND TITANIUM NITRIDE

Michael B. Miller, DeSoto, Tex., and Robert D. Bertin, Foster City, Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 28, 1988, Ser. No. 173,957

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—336 7 Claims



1. A fixture for holding components to be joined by brazing which comprises a graphite substrate having a first layer of titanium carbide on at least a portion of the surface of the substrate and a second layer of titanium nitride overlaying said layer of titanium carbide.

2. The fixture according to claim 1 wherein said layer of titanium carbide has a thickness of about 0.0001 to 0.0003 inches and said titanium nitride layer has a thickness of about 0.0003–0.0005 inches.

3. The fixtures according to claim 1 wherein said graphite substrate has the following properties;

Density: 1.8–2.0 $grams/cm^3$

Grain size: 0.0001–0.0010 inches

Compressive strength: >10,000 psi

Flexural strength: >6,400 psi

Coefficient of thermal expansion: $(4.8–5.1)\times10^{-6}$ cm/cm/°C.

4,892,789

MAGNETIC RECORDING MEDIUM

Masatoshi Nakayama; Yasufumi Takasugi, and Kunihiro Ueda, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

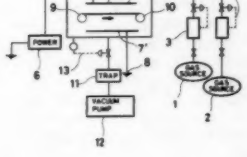
Filed Dec. 23, 1985, Ser. No. 812,897

Claims priority, application Japan, Dec. 25, 1984, 59-279748

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—336 4 Claims



1. A magnetic recording medium consisting essentially of a substrate, a ferromagnetic metal thin film formed on the substrate, and a top coat formed on the thin film, characterized in that

the top coat comprises a plasma-polymerized film consisting essentially of carbon and hydrogen in an atomic ratio of carbon to hydrogen in the range of from 1:1 to 6:1 and having a thickness of from 10 to 30 Å and an organic material film vacuum deposited on the plasma-polymerized film and having a thickness of from 10 to 60 Å.

4,892,790

OXIDATION-INHIBITED CARBONOUS MATERIALS

Paul E. Gray, San Diego, Calif., assignor to General Atomics, San Diego, Calif.

Continuation of Ser. No. 798,994, Nov. 18, 1985, which is a continuation-in-part of Ser. No. 676,985, Nov. 30, 1984. This application Dec. 6, 1985, Ser. No. 805,887

Int. Cl.[4] B22F *7/01*

U.S. Cl. 428—548 10 Claims

1. An oxygen-resistant, high-temperature structure comprising

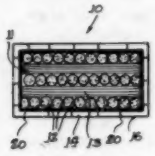
a carbonous structural matrix formed with interstices throughout,

boron, in elemental form and/or as moiety of a compound, said boron being dispersed throughout said matrix, silicon in elemental form and/or as a moiety of a compound, said silicon being dispersed throughout said matrix, plus an additional metal or metalloid, in elemental form and/or as

a moiety of a compound, said metal or metalloid being dispersed throughout said matrix,

said boron, said silicon and said additional metal or metalloid each oxidizing when exposed to a high-temperature, oxidizing environment to form borosilicate plus a metal oxide or a metalloid oxide within the interstices and at the surface of said matrix;

the boron plus silicon plus said additional metal or metalloid, calculated as if in their fully oxidized forms, comprising between about 10 about 1000 weight percent of the carbon



in said matrix, said silicon, calculated as a silicon oxide, being present in amounts of from about 3 to about 40 mole percent of silicon plus boron, calculated as silicon oxide plus boron oxide, said metal or metalloid, calculated as if fully oxidized, being present in an amount of from about 3 to about 50 mole percent of boron plus silicon, calculated as boron oxide plus silicon oxide;

at high temperatures, the metal oxide or metalloid oxide which forms stabilizing the viscosity of the molten phase of the borosilicate which forms.

4,892,791

BODY COATED WITH CUBIC BORON NITRIDE & METHOD FOR MANUFACTURING THE SAME

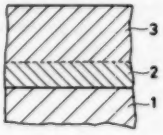
Kazuhiro Watanabe; Kazuya Saito; Yoshiyuki Yuchi, and Konosuke Inagawa, all of Ibaragi, Japan, assignors to Nihon Sinku Gijutsu Kabushiki Kaisha, Japan

Filed Mar. 25, 1988, Ser. No. 173,663

Claims priority, application Japan, Mar. 27, 1987, 62-071856

Int. Cl.[4] B32P *15/28;* **B32B** *27/14;* **C04B** *41/06*

U.S. Cl. 428—698 **7 Claims**



1. A body coated with cubic boron nitride comprising:

(A) a base material;

(B) a first interlayer formed on said base material; and/or a second interlayer formed on said first interlayer or said base material; and

(C) a cubic boron nitride film formed on said first interlayer or said second interlayer;

wherein said first interlayer comprises nitride or boride mixed with at least one element of the IVb group, IIIb group, Vb group, IVa group, Va group and VIa group of the periodic table, in accordance with the quality of the material of said base material, said at least one element having a composition ratio which decreases towards the surface between said first interlayer and said second interlayer or said first interlayer and said cubic boron nitride film; said second interlayer comprises nitride or boride mixed with at least one element of the IVb group, IIIb group, Vb group, IVa group, Va group and VIa group of the periodic table, in accordance with the quality of the material of said base material, at a total mixing amount of 0.01 atomic % to 10 atomic %, and shows an absorption peak at the wave number of 950 cm^{-1} to 1150 cm^{-1} according to the infrared absorption spectrum, and said cubic boron nitride film shows a maximum absorption peak at the wave

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4,892,792

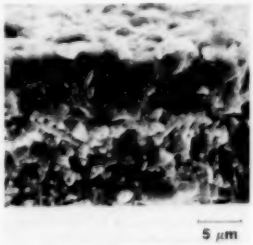
A1N COATED SILICON NITRIDE BASED CUTTING TOOLS

Vinod K. Sarin, Lexington, and Charles D'Angelo, Southboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 103,333, Oct. 1, 1987, abandoned. This application Aug. 12, 1988, Ser. No. 233,876

Int. Cl.[4] C23C *11/08;* **B32B** *13/04*

U.S. Cl. 428—698 **8 Claims**



1. A wear resistant coated article comprising a densified monolithic or composite silicon nitride-based substrate body having an adherent refractory coating layer deposited thereon, the coating layer consisting essentially of aluminum nitride.

4,892,793

NICKEL-CADMIUM CELL APPARATUS

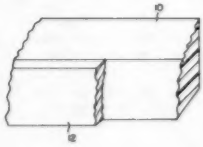
Klaus von Benda, Nürtingen; Gábor Benczúr-Ürmössy, Stuttgart; Gerhard Berger, Deizisau; Rainer Klink, Kernen, and Uwe Gierz, Plochingen, all of Fed. Rep. of Germany, assignors to Deutsche Automobilgesellshaft mbH, Hanover, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 207,501

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720072

Int. Cl.[4] H01M *10/34*

U.S. Cl. 429—60 **7 Claims**

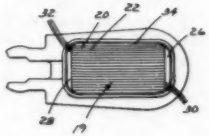


1. Sealed nickel-cadmium cell apparatus which works on the oxygen cycle principle and which has a charge and discharge reserve at the negative electrode and has a gas diffusion body at the side of the negative electrode facing away from the positive electrode, comprising a hermetically sealed cell including oxygen and gases which cannot be reacted in the cell having a partial pressure, the partial pressure of the gases which cannot be reacted in the cell being below 0.4 bar and the hermetically sealed cell having a substantially gas tight plastic housing and a layer which inhibits the diffusion of nitrogen disposed on at least 85% of a surface of the housing.

4,892,794
BATTERY

Matthew T. Scholz, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 18, 1988, Ser. No. 220,661
Int. Cl.[4] H01M *10/02*
U.S. Cl. 429—72 16 Claims



1. A battery adapted to withstand high temperatures, such as generated during heat or steam sterilization, comprising a casing defining at least one battery cell, aqueous fluid electrolyte in the cell, a generally hydrophilic electrode assembly in the cell including cooperating positive and negative electrodes immersed in the electrolyte, a vent in the casing for venting gases and pressure during recharging and heat-sterilizing, and porous material in the cell generally adjacent the electrode assembly for holding excess electrolyte, the porous material being hydrophobic and having a hydrophobicity sufficiently large relative to the electrode assembly that electrolyte in the porous material tends to migrate into the electrode assembly to wet the electrodes while excess electrolyte is stored in the porous material.

4,892,795
NON-AQUEOUS CELL COMPRISING NIOBIUM TRISELENIDE

Wei-Chou Fang, Bridgewater, and Brijesh Vyas, Warren, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 14, 1988, Ser. No. 244,218
Int. Cl.[4] H01M *4/58, 6/00*
U.S. Cl. 429—194 14 Claims

1. A process of making a nonaqueous cell comprising a lithium negative electrode, a separator, a positive electrode comprising niobium chalcogenide active material, and electrolyte, the process characterized in that the positive electrode is made by a procedure that comprises the steps of

a. forming a layer of niobium powder on a substrate; and

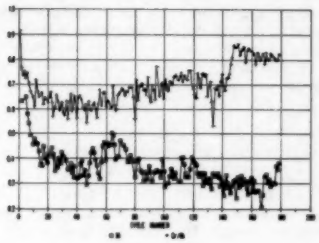
b. reacting the niobium powder with selenium vapor or with sulfur vapor to form the niobium chalcogenide active material.

4,892,796
POSITIVE CURRENT COLLECTOR FOR LITHIUM SECONDARY SYSTEM

On-Kok Chang; John C. Hall, both of San Jose; Jeffrey Phillips, Saratoga, and Lenard F. Silvester, Scotts Valley, all of Calif., assignors to Altus Corporation, San Jose, Calif.

Filed Aug. 26, 1988, Ser. No. 237,190
Int. Cl.[4] H01M *6/14, 6/02*
U.S. Cl. 429—196 7 Claims

1. In a rechargeable non-aqueous electrochemical cell having a positive terminal, a negative terminal, a current collector and cathode attached to the positive terminal, an anode of alkali metal connected to the negative terminal and a non-aqueous electrolyte solution in contact with the cathode and anode,

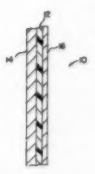


the improvement comprising a current collector comprising a chrome foil plated upon a core of nickel.

4,892,797
BIPOLAR ELECTRODE AND PROCESS FOR MANUFACTURING SAME

Bhaskara M. L. Rao, Flemington; William Kobasz, Edison, and James C. Menke, Long Valley, all of N.J., assignors to Alupower, Inc., Warren, N.J.

Filed Mar. 10, 1989, Ser. No. 321,896
Int. Cl.[4] H01M *6/48*
U.S. Cl. 429—210 11 Claims



1. A bipolar electrode structure, which comprises;

an electrically conductive intermediate layer of a thickness of less than about 5 mils having pressure sensitive adhesive surfaces and a volume resistively of at least 0.5 ohm-cm but less than 100 ohm.cm;

an electronegative layer disposed on a surface of said intermediate layer; and

an electropositive layer disposed on an opposite surface of said intermediate layer.

4,892,798
ELECTROPHORETIC IMAGING METAL-TONER FLUID DISPERSION

William M. Lamanna; Robin E. Wright, and Hsin-Hsin Chou, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 13, 1988, Ser. No. 283,596
Int. Cl.[4] G03G *13/10*
U.S. Cl. 430—38 23 Claims

21. A method comprising the steps:

(a) providing a toner fluid dispersion comprising electrostatically charged, colloidal, elemental metal particles dispersed in an electrically nonconductive organic carrier liquid of dielectric constant less than 3.5 and having a volume resistivity greater than 10^{12} ohm.cm, and providing a dielectric or photoconductive substrate,

(b) electrophoretically and irreversibly depositing the charged, colloidal, elemental metal particles of the toner fluid in a continuous or imagewise fashion on at least one of the surfaces of said substrate using standard electro-

graphic techniques to provide a nonconductive, colloidal, elemental metal coating thereon, and

(c) optionally, in the case of a catalytically active colloidal, elemental metal, subjecting the resulting colloidal metal coated substrate to an electroless metal plating solution to induce selective metal plating on the elemental colloidal metal coated portions of the substrate surface, to provide a second elemental metallic coating on said portions of the substrate surface which is electrically conductive.

4,892,799
4-CHLOROOXAZOLE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION AND USE

Rainer Wingen, Hattersheim; Dieter Guenther, Kelkheim, and Juergen Lingnau, Mainz-Laubenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,596

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706880

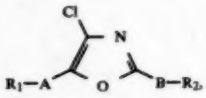
Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—77 **7 Claims**

1. A recording material comprising:

a support;

at least one photoconductive layer on the support comprising a 4-chlorooxazole compound of general formula I:



(I)

wherein:

A is a single bond or the —CH=CH— group,

B is a single bond, the —CH=CH— or —CH=CH—CH=CH— group and is a single bond, in the case of A representing the —CH=CH— group,

R_1 is phenyl, which is optionally substituted in one or more positions by (C_1–C_4)-alkoxy or di-(C_1–C_4)-alkylamino radicals, and

R_2 is phenyl, phenyloxazolyl, pyridyl, julolidin-9-yl, N-(C_1–C_4-alkyl) carbazol-3-yl, coumarin-6-yl or stilbene-4-yl, which are optionally substituted in one or more positions by (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, halogen-(C_1–C_4)-alkoxy, hydroxy, halogen, di-(C_1–C_4)-alkylamino or dibenzylamino radicals.

4,892,800
PHOTOSENSITIVE MEMBER HAVING A PHOTOCONDUCTIVE LAYER COMPRISING A CARBONIC FILM FOR USE IN ELECTROPHOTOGRAPHY

Masao Sugata, Yokohama; Tatsuo Takeuchi, Kawasaki; Hiroshi Satomura, Hatogaya; Yoshihiro Oguchi, Yokohama; Akio Maruyama, Tokyo; Keishi Saito, Nabari; Tohru Den, Atsugi; Susumu Ito; Keiji Hirabayashi, both of Tokyo; Keiko Ikoma, Yokohama; Noriko Kurihara, Kawasaki, and Kuniji Osabe, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,314

Claims priority, application Japan, Sep. 24, 1986, 61-225218; Sep. 26, 1986, 61-227304; Sep. 26, 1986, 61-227305; Sep. 26, 1986, 61-227306

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—85 **8 Claims**

1. A photosensitive member for use in electrophotography comprising a substrate and a photoconductive layer comprising a film containing carbon atoms in an amount of at least 65 atomic percent and at least one element selected from the group consisting of boron, aluminum, gallium, indium, thallium, nitrogen, phosphorus, arsenic, antimony and bismuth in an amount of 5 atomic ppm to 5 atomic percent; said film having a matrix of said carbon atoms and said film having a value of 0.16 to 1.9 for the ratio of I_D/I_G between the peak intensity (I_D) of 1333 cm^{-1} and the peak intensity (I_G) of 1580 cm^{-1} in Raman spectra.

4,892,801
MIXED ESTER O-QUINONE DIAZIDE PHOTOSENSITIZERS AND PROCESS OF PREPARATION

Robert E. Potvin, West Warwick; Jonas O. St. Alban, Westerly, and Chester J. Sobodacha, Coventry, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 858,631, May 2, 1986, Pat. No. 4,732,837. This application Mar. 21, 1988, Ser. No. 170,534

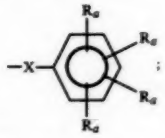
Int. Cl.[4] G03C *1/54;* **C07C** *113/00*

U.S. Cl. 430—193 **19 Claims**

1. A photosensitive compound represented by the general formulae (1):

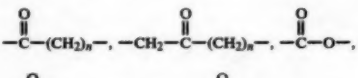
(1)

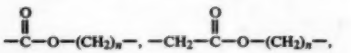
wherein R is

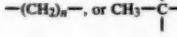


;

X is a single C—C bond, —O—, —S—,







n is 1 or 2, R_a is H, —OH, —OY, —OZ, halogen or lower alkyl, with at least one R_a radical being —OY and at least one thereof being —OX;

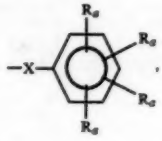
wherein Y is 1,2-naphthoquinonediazide-5-sulfonyl and Z is —W—R_3, where W is

or —SO_2—, and R_3 is alkyl, aryl, substituted alkyl or substituted aryl; and the total amount of Diazo and organic acid halide reacted with the phenolic compound is that amount sufficient to produce a photosensitizer condensate capable of inhibiting the dissolution rate of an alkali soluble resin when mixed with said resin.

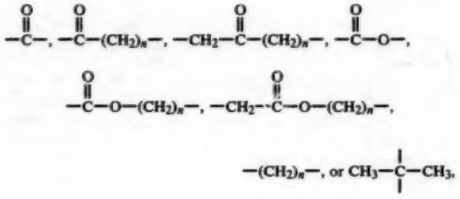
2. A photosensitizer comprising the condensation product of:

(I) a phenolic compound having the formula:

wherein R is



R_a is H, —OH, halogen or lower alkyl, with at least two and not greater than six R_a radicals being —OH, X is a single C—C bond, —O—, —S—, —SO_2—,



n is 1 or 2 and

(II) a 1,2-naphthoquinonediazide-5-sulfonic acid (Diazo); and

(III) an organic acid halide represented by the formula:

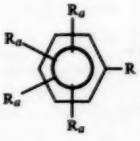
wherein W is

or —SO_2—V, V is halogen and R_3 is alkyl, aryl, substituted alkyl or substituted aryl;

wherein the molar ratio of the amount of Diazo reacted to the amount of organic acid reacted is in the range of from about 1:2 to about 19:1; and the total amount of Diazo and organic acid halide reacted with the phenolic compound is that amount sufficient to produce a photosensitizer condensate capable of inhibiting the dissolution rate of an alkali soluble resin when mixed with said resin.

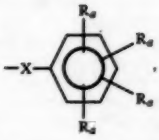
3. A method of preparing a photosensitizer condensate comprising:

condensing a phenolic compound represented by the general formulae (A):

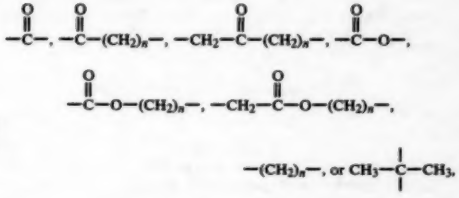


(A)

wherein R is



R_a is H, —OH, halogen lower or lower alkyl, with at least two and not greater than six R_a radicals being —OH, X is a single C—C bond, —O—, —S—, —SO_2—,



n is 1 or 2; with a 1,2-naphthoquinonediazide-5-sulfonic acid (Diazo) and with an organic acid halide represented by the formula W—R_3, wherein W is

or —SO_2—V, V is halogen, R_3 is alkyl, aryl, substituted alkyl or substituted aryl; wherein the molar ratio of the amount of Diazo to the amount of organic acid halide to be reacted is in the range of from about 1:2 to about 19:1; and the total amount of Diazo and organic acid halide reacted with the phenolic compound is that amount sufficient to produce a photosensitizer condensate capable of inhibiting the dissolution rate of an alkali soluble resin when mixed with said resin; wherein said condensing is conducted in a solvent medium in the presence of an acid scavenger; and then subsequently isolating said photosensitizer condensate.

4,892,802

POSITIVE WORKING TONABLE FILM HAVING A PHOTOHARDENABLE LAYER

Richard D. Bauer, Towanda, Pa.; Ursula A. Kraska, Pfungstadt, and Manfred A. Sondergeld, Mulheim/Main, both of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 129,149, Dec. 7, 1987, abandoned, which is a continuation of Ser. No. 857,313, Apr. 30, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,248

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—270 **7 Claims**

1. A positive working tonable film comprising a synthetic resin support layer and a photohardenable layer having a thickness from about 2 microns to about 1 mm consisting essentially of a mixture of:

(a) about 10 to about 80 weight % of at least one ethylenically unsaturated photopolymerizable compound based on the total weight of the dried film;

(b) about 20 to about 90 weight % of binder based on the total weight of the dried film wherein a binder is selected from the group consisting of single polymers with Tg≦70° C. and mixtures of polymers each with Tg≦80° C., the binder is at least one thermoplastic copolymer selected from the group consisting of esters of acrylic acid and esters of methacrylic acid and the copolymer pos-

sesses at least 2 weight percent acid salt forming groups selected from the group consisting of carboxyl, sulfonic acid, sulfonamide and hydroxyl groups;

(c) at least one crosslinking agent selected from the group consisting of compounds of multivalent metals of groups IIA-IVA, IIB-IVB and VIIB of the Periodic Chart, said agent being present in an effective amount to reduce temperature dependency during toning wherein fluctuations in achievable toned density due to temperature are less than fluctuations in achievable toned density in a positive working tonable film comprising a synthetic resin support layer and a photohardenable layer consisting essentially of (a), (b), and (d); and

(d) about 0.01 to about 15 weight percent of a photoinitiator or photoinitiating system activatable by actinic radiation based on the total weight of the dried film.

4,892,803

COLOR IMAGE-FORMING PROCESS COMPRESSING DEVELOPER CONTAINING NO BENZYL ALCOHOL

Kokichi Waki; Kazunori Hasebe, and Masahiro Asami, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

PCT No. PCT/JP87/00046, § 371 Date Sep. 23, 1987, § 102(e) Date Sep. 23, 1987, PCT Pub. No. WO87/04533, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 23, 1987, Ser. No. 107,833

Claims priority, application Japan, Jan. 23, 1986, 61-13414

Int. Cl.[4] G03C *7/30/7/26*

U.S. Cl. 430—380 18 Claims

1. A color image-forming process which comprises developing, after imagewise exposure, a color photographic light-sensitive material comprising a reflective support having provided thereon at least one silver halide emulsion layer containing a core/shell surface latent image type monodispersed silver halide emulsion (having a variation coefficient of up to 0.15) containing no silver iodide, having a silver chloride content of up to 80 mol%, and having a silver bromide content in the shell portion lower than that in the core portion with a color developer containing substantially no benzyl alcohol within 2 minutes and 30 seconds.

4,892,804

PHOTOGRAPHIC COLOR DEVELOPING COMPOSITIONS WHICH ARE ESPECIALLY USEFUL WITH HIGH CHLORIDE PHOTOGRAPHIC ELEMENTS

Sheridan E. Vincent, and Richard W. Berls, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 822,097, Jan. 24, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 233,882

Int. Cl.[4] G03C *7/30, 7/00, 7/40*

U.S. Cl. 430—380 25 Claims

1. A photographic color developing composition which is especially useful in the development of high chloride silver halide photographic elements, said composition being substantially free of bromides and comprising:

(1) a primary aromatic amino color developing agent,

(2) N,N-diethylhydroxylamine,

(3) at least one sequestering agent which functions to sequester iron,

(4) at least one sequestering agent which functions to sequester calcium, and (5) from zero to 0.2 moles of sulfite per mole of said primary aromatic amino color developing agent.

4,892,805

PHOTOGRAPHIC ELEMENT AND PROCESS

Arlyce T. Bowne; Robert F. Romanet, both of Rochester, and Sharon E. Normandin, Macedon, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,197

Int. Cl.[4] G03C *7/38*

U.S. Cl. 430—387 8 Claims

6. A process of forming a dye image in an exposed photographic element comprising a support bearing a photographic silver halide emulsion, said process comprising developing the photographic element with a silver halide color developing agent in the presence of a color coupler comprising a pyrazoloazole coupler comprising at least one polyether group (A) comprising at least three ether (—O—) groups and terminated by a hydroxy, carboxy or sulfonamide group.

4,892,806

NON-IONIC SURFACE ACTIVE COMPOUNDS AND PHOTOGRAPHIC MATERIALS CONTAINING THEM

Catherine B. A. Briggs, Middlesex, and Alan R. Pitt, Hertfordshire, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

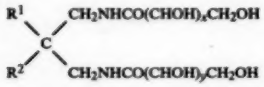
Filed Sep. 26, 1988, Ser. No. 249,741

Claims priority, application United Kingdom, Oct. 30, 1987, 8725486

Int. Cl.[4] G03C *1/04, 1/38;* G07C *103/07, 103/10*

U.S. Cl. 430—449 20 Claims

16. A process for preparing a photographic coating composition which comprises dispersing an oil soluble photographic additive in an aqueous solution of a hydrophilic colloid in the presence of a dispersion aid, characterized in that the dispersion aid comprises a water soluble surface active compound having the formula



wherein

each of R^1 and R^2 independently is hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted cycloalkyl, or substituted or unsubstituted aryl, provided that not both R^1 and R^2 are hydrogen,

and each of x and y independently is an integer from 3 to 6.

4,892,807

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL EXCELLENT IN TREATMENT STABILITY

Shigeto Hirabayashi; Hirokazu Sato, and Eiichi Sakamoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,214

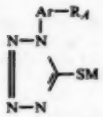
Claims priority, application Japan, Aug. 1, 1986, 61-181528

Int. Cl.[4] G03C *7/34, 1/34*

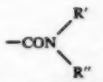
U.S. Cl. 430—505 9 Claims

1. A silver halide photographic light-sensitive material comprising a support having thereon photographic component layers comprising a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer, wherein said red-sensitive silver halide emulsion layer contains silver halide grains comprising not less than 90 mol % of silver chloride, a compound represented by the following formula [S] and a cyan coupler represented by the following formula [I]:

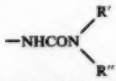
Formula [S]



wherein Ar is an arylene group or a cycloalkylene group; R_A is an alkyl group, an alkoxy group, a carboxyl group or its salt, a sulfo group or its salt, a hydroxyl group, an amino group, an acylamino group, a

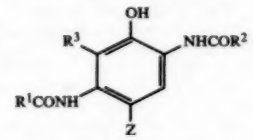


group, an $—NHSO_2R''$ group or an



group, R′ and R″ being a hydrogen atom an alkyl group or an aryl group, respectively, and M is a hydrogen atom, an alkali metal atom or an ammonium group;

Formula [I]



wherein R^1 is an alkyl group or an aryl group; R^2 is an alkyl group, a cycloalkyl group, an aryl group or a heterocyclic group; R^3 is a hydrogen atom, a halogen atom, an alkyl group or a alkoxy group, R^3 and R^1 being allowed to form a ring by coupling with R^1; Z represent a hydrogen atom or a group capable of being splitted off upon reaction with the oxidized product of an aromatic primary amine color developing agent.

4,892,808

PHOTOGRAPHIC MATERIAL PROTECTED AGAINST HYDROGEN CYANIDE GAS

Kenneth G. Harbison, Rochester, and Wilbur S. Gaugh, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 208,911, Jun. 20, 1988, abandoned. This application May 12, 1989, Ser. No. 352,322

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—517 **12 Claims**

1. A photographic assemblage comprising:

(a) a light-sensitive photographic element comprising a support bearing a sulphur and gold sensitized silver halide emulsion layer, and

(b) an associated non-light sensitive material comprising a support and carbon black,

the assemblage containing, as a scavenger for hydrogen cyanide gas in a location where it will intercept hydrogen cyanide gas evolving from the carbon black before the gas reaches the silver halide in the photosensitive element, a noble metal compound selected from the group consisting of palladium, gold and platinum, in an amount of about 1 to 250 parts metal per million parts carbon black by weight, or a noble metal compound selected from the group consisting of iridium, rhodium and osmium in an amount of about 10 to 1000 parts metal per million parts carbon black, by weight.

4,892,809

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Yasuhito Momoki, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 909,232, Sep. 19, 1986, abandoned. This application May 11, 1989, Ser. No. 351,273

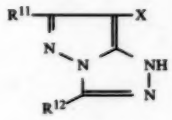
Claims priority, application Japan, Sep. 20, 1985, 60-208313

Int. Cl.[4] G03C *7/38*

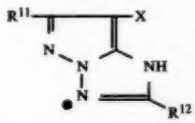
U.S. Cl. 430—550 **13 Claims**

1. A silver halide color photographic material comprising a support and at least one silver halide emulsion layer disposed on said support, wherein said emulsion layer contains at least one type of magenta coupler from a pyrazoloazole system represented by Formula (V) or (VI) below, and said silver halide emulsion is a silver chlorobromide emulsion or a silver chloroiodobromide emulsion which is chemically sensitized in the presence of at least one compound selected from the group consisting of deoxyribonucleic acid, ribonucleic acid, adenine, guanine, uracil, cytosine and thymine prior to the completion of chemical sensitization by sulfur compounds:

Formula(V):



Formula(VI):



wherein R^{11} and R^{12}, which may be the same or different from each other, independently represent a hydrogen atom, halogen atom, alkyl group, aryl group, heterocyclic group, cyano group, alkoxyl group, aryloxy group, heterocyclic oxy group, acyloxy group, carbamoyloxy group, silyloxy group, sulfonyloxy group, acylamino group, anilino group, ureido group, imido group, sulfamoylamino group, carbamoylamino group, alkylthio group, arylthio group, heterocyclic thio group, alkoxycarbonylamino group, aryloxycarbonylamino group, sulfonamido group, carbamoyl group, acyl group, sulfamoyl group, sulfonyl group, sulfinyl group, alkoxycarbonyl group, and aryloxycarbonyl group; and X represents a hydrogen atom, halogen atom, carboxyl group, or a coupling split-off group connected through an oxygen atom, nitrogen atom, or sulfur atom; or the magenta coupler may be a dimer or a polymer connected through R^{11}, R^{12} or X.

4,892,810

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING CYAN DYE FORMING COUPLER

Kozo Aoki; Michio Ono, and Naoki Saito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

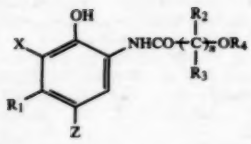
Continuation of Ser. No. 9,065, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 748,537, Jun. 25, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,518

Claims priority, application Japan, Jun. 25, 1984, 59-130745

Int. Cl.[4] G03C *7/34*

U.S. Cl. 430—553 **11 Claims**

1. A silver halide color photographic light-sensitive material containing a cyan dye forming coupler represented by the following general formula (I):



(I)

wherein R_1 represents an alkyl group having 2 to 15 carbon atoms, R_2 and R_3 each represent a hydrogen atom or an alkyl group, R_4 represents a substituted aryl group which is substituted by a group other than an aryl group or an aralkyl group, wherein said group other than an aryl group or an aralkyl group can be at least one alkyl group, X represents a chlorine atom or a fluorine atom, Z represents a chlorine atom or a fluorine atom, n represents an integer of 1 to 4, and the total number of carbon atoms in the alkyl groups contained in R_1, R_2, R_3, and R_4 is 8 or more, and the total number of carbon atoms in the alkyl groups contained in R_1 and R_4, in the case that n is 1, is 11 or less.

4,892,811

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Morio Yagihara; Mitsunori Ono, and Akihiko Ikegawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

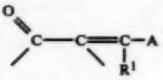
Continuation of Ser. No. 788,198, Oct. 16, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 121,242

Claims priority, application Japan, Oct. 16, 1984, 59-216928

Int. Cl.[4] G03C *5/54, 1/42, 7/26, 1/34*

U.S. Cl. 430—562 **14 Claims**

14. A silver halide photographic material which comprises a support having coated thereon a light-sensitive silver halide emulsion layer, wherein the photographic material contains a blocked photographic agent represented by the following general formula (I):



(I)

Z

wherein A represents a photographic agent moiety which is bonded to a blocking moiety through a hetero atom, or a precursor thereof; R^1 represents a hydrogen atom or a substituent group; and Z represents atoms necessary to form a carbocyclic ring or a heterocyclic ring, wherein A is a group represented by the following general formula (II):

$$X_mB \qquad \text{(II)}$$

wherein B represents a photographic agent moiety selected from the group consisting of azo dyes and azomethine dyes which is bonded to X through a hetero atom contained in B; X represents a divalent linkage group which is bonded to a blocking moiety through a hetero atom contained in X; and m is 0 or 1, wherein the photographic agent moiety represented by B is bonded to the divalent linkage group represented by X through a hetero atom contained therein.

4,892,812

SILVER HALIDE PHOTOSENSITIVE MATERIALS

Isao Kohmura, and Katsuaki Iwaosa, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 575,998, Feb. 1, 1984. This application Oct. 27, 1986, Ser. No. 924,169

Claims priority, application Japan, Feb. 4, 1983, 58-16094; Feb. 4, 1983, 58-16095; Feb. 25, 1983, 58-31413; Feb. 25, 1983, 58-31414; Feb. 25, 1983, 58-31415; Feb. 28, 1983, 58-33600; Mar. 29, 1983, 58-54535; Mar. 29, 1983, 58-54536

Int. Cl.[4] G03C *1/34, 1/36*

U.S. Cl. 430—567 **4 Claims**

1. A silver halide photographic photosensitive material which comprises a support and photographic layers including at least one silver halide emulsion layer which contains (1) a spectrally unsensitized negative silver halide having an average grain size of 0.1 to 0.3 μm and containing at least 80 mol % of silver chloride and (2) an organic desensitizer having an anodic polargraphic potential and a cathodic polargraphic potential which give a positive sum,

wherein said emulsion has undergone substantially no chemical ripening and

wherein said photosensitive material contains:

(c) (iv) 2-mercaptobenzoic acids.

4,892,813

METHOD FOR THE DETERMINATION OF THE ENZYMATIC ACTIVITY OF CONVERTASE

Paul Cohen, Paris; Alain Morel, Puteaux; Sophie Gomez, Issy les Moulineaux; Christine M. Clamagirand; Pablo Gluschankof, both of Paris; Pierre Nicolas, Argenteuil, and Hamadi Boussetta, Paris, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Continuation of Ser. No. 796,042, Nov. 7, 1985, abandoned. This application Oct. 30, 1987, Ser. No. 117,896

Int. Cl.[4] C12Q *1/00, 1/34, 1/36, 1/38*

U.S. Cl. 435—4 **7 Claims**

1. A method for measuring the enzymatic activity of a convertase that enzymatically cleaves a neuropeptide precursor at an excision site comprising:

(a) contacting a biological sample containing the convertase with a labeled peptide substrate consisting of at least 10 amino acids and no more than 20 amino acids, reproducing or mimicking the sequence of the precursor at the excision site,

(b) incubating for a time to allow for conversion, and

(c) measuring the enzymatic activity of the sample by determining the precentage of labeled conversion fragments relative to one or more standards.

4,892,814

METHOD FOR DISTINGUISHING CREUTZFELDT-JAKOB DISEASE FROM OTHER DEMENTIAS

Michael G. Harrington; Carl R. Merril, both of Rockville; David M. Asher, Chevy Chase, and D. Carleton Gajdusek, Frederick, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 22, 1987, Ser. No. 67,420

Int. Cl.[4] C12Q *1/70*

U.S. Cl. 435—5 **3 Claims**

1. A method for distinguishing Creutzfeldt-Jakob disease from other causes of human dementia wherein it has been clinically determined that the patient does not suffer from herpes simplex encephalitis comprising analyzing the cerebrospinal fluid of a patient for proteins 130 and 131, the presence of proteins 130 and 131 in the cerebrospinal fluid indicating the presence of Creutzfeldt-Jakob disease.

4,892,815

PROCESS AND REAGENT FOR THE SPECIFIC DETERMINATION OF THE CHOLESTEROL OF THE HDL FRACTION

Lorenz Kerscher, Penzberg; Brigitte Pautz; Gisela Trank, both of Herrsching, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Oct. 6, 1987, Ser. No. 107,467

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636851

Int. Cl.[4] C12Q *1/60 A*; G01N *33/68, 33/92 B*

U.S. Cl. 435—7 17 Claims

1. Process for specific determination of HDL cholesterol in a serum lipoprotein containing sample which contains LDL comprising adding to said sample pancreatic cholesterol esterase to liberate cholesterol from cholesterol esters, cholesterol oxidase and oxygen to oxidize said liberated cholesterol with the formation of hydrogen peroxide and kinetically measuring one of hydrogen peroxide formation or oxygen consumption, within 2–15 minutes thereafter as a measurement of HDL cholesterol, said measuring and reaction taking place at a temperature of from 20° C to 40° C during a predetermined time interval during which measurement one maintains a pancreatic cholesterol esterase concentration of from 0.05 to 30 U/ml, a cholesterol oxidase concentration of from 0.1 to 50 U/ml, a tenside of a bile acid group at a concentration of from 1.0 to 20 mMole/liter, concentration of a non-ionic detergent of from 0.1 to 10g/liter and a pH of from 5 to 9.

4,892,816

METHOD FOR THE DETERMINATION OF CHOLESTEROL

Tetsunori Akiba, Kani, and Kuniyoshi Matsunaga, Ichinomiya, both of Japan, assignors to Amano Pharmaceutical Co., Ltd., Aichi, Japan

Continuation of Ser. No. 788,581, Oct. 17, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,522

Claims priority, application Japan, Oct. 31, 1984, 59-229290

Int. Cl.[4] C12Q *1/60, 1/44, 1/26, 1/32*

U.S. Cl. 435—11 13 Claims

1. An enzymatic method for measurement of cholesterol, which comprises:

(1) preparing a test sample;

(2) mixing the test sample with a reagent composition comprising:

(a) a cholesterol dehydrogenase,

(b) an oxidizing agent selected from the group consisting of nicotinamide-adenine dinucleotide (NAD) and nicotinamide-adenine dinucleotide phosphate (NADP), and,

(c) from about 10 to about 100 mg/ml in final working solution of non-ionic surfactant;

(3) incubating the mixture at a room temperature from about 20° C. to about 40° C. and a pH from about 6.0 to about 10.0; and

(4) measuring an absorbency increase per unit time of the resulting detectable oxidized and reduced products kinetically.

4,892,817

STABLE PHOSPHATASE SUBSTRATE COMPOSITION

Jan W. Pawlak, Oakland, Calif., assignor to Biogenex Laboratories, San Ramon, Calif.

Filed Sep. 21, 1987, Ser. No. 99,062

Int. Cl.[4] C12Q *1/42, 1/00*

U.S. Cl. 435—21 18 Claims

1. A stabilized phosphatase substrate composition, comprising:

(a) an indoxyl phosphate;

(b) a tetrazolium salt; and

(c) a water-soluble ferricyanide/ferrocyanide salt, comprising a mixture of ferricyanide and ferrocyanide alkali metal salts having a molar ratio of Fe^{3+} to Fe^{2+} of 1:1 to 20:1.

4,892,818

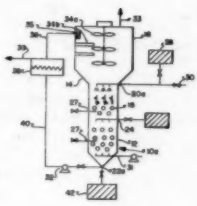
BIOREACTOR

Floyd Ramp, 3948 Humphrey Rd., Richfield, Ohio 44286

Filed Feb. 5, 1987, Ser. No. 11,315

Int. Cl.[4] C12Q *1/24*

U.S. Cl. 435—30 7 Claims



1. A process for conducting microbiological reactions in a vertical hollow containing column packing particles classifiable by means of differential liquid settling rates, said column having a lower reaction section in which said microbiological reactions take place, and an upper disengagement section in which said packing particles can be dispersed and in which separation of biological fouling from said packing particles occurs, said upper disengagement section having a larger cross-sectional area than said lower reaction section, as well as a reactant inlet near one end, and a product outlet near the other end, comprising the following sequential steps:

(1) continuously introducing a liquid near the bottom end of the column and continuously removing said liquid near the top end of the column at a flow rate such that its upward linear velocity exceeds the settling rate of said column packing particles, and maintaining the flow rate until said column packing particles have been substantially dispersed within said disengagement section;

(2) thereafter, gradually reducing the flow rate so that sai particles slowly settle into the column's reaction section, thereby classifying said packing particles in an initial classified condition in which faster settling packing particles are located toward the lower end of said reaction section, while slower settling packing particles are located toward the upper end of said reaction section;

(3) exposing said packing particles to an inoculant containing selected bioreaction microorganisms;

(4) continuously introducing a liquid feed comprising microorganism nutrients into a reactant inlet near the bottom end of said column at a substantially constant flow rate such that its upward linear velocity is insufficient to suspend said packing particles, and continuously removing product and unreacted feed from a product outlet located near the top end of said column;

(5) wherein when packing particle fouling has progressed to a determined point, the column is cleaned by increasing the flow rate of a liquid through the column so as to provide an upward linear velocity sufficient to prevent the settling of said packing particles, until said packing particles have been substantially dispersed within said disengagement section;

(6) thereafter, maintaining said flow rate at the point at which its upward linear velocity is sufficient to prevent the settling of said packing particles, allowing them to remain substantially suspended in such dispersed state within the disengagement section until the desired amount of said fouling has been removed from the packing particles, and from the column;

(7) thereafter gradually reducing the flow rate below the linear settling rate of said packing particles, allowing them

to slowly settle into the column's reaction section substantially oriented in the initial classified condition in which said faster settling particles are located toward the lower end of said reaction section, while said slower settling particles are located toward the upper end of said reaction section; and

(8) reestablishing the biological reaction using the process of step (4).

4,892,819

RECOMBINANT DNA EXPRESSION VECTORS AND DNA COMPOUNDS THAT ENCODE ISOPENICILLIN N SYNTHETASE FROM PENICILLIUM CHRYSOGENUM

Lucinda G. Carr; Thomas D. Ingolia; Stephen W. Queener, all of Indianapolis, and Paul L. Skatrud, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 25, 1985, Ser. No. 801,523

Int. Cl.[4] C12P *21/00, 1/02;* **C12N** *15/00, 9/00*

U.S. Cl. 435—69.1 **65 Claims**

1. An isolated DNA compound that comprises a DNA sequence that encodes the isopenicillin N synthetase activity of *Penicillium chrysogenum.*

48. A method of producing isopenicillin N synthetase in a recombinant host cell that comprises:

(1) transforming said host cell with a recombinant vector that comprises:

(a) a transcription and translation activating sequence; and

(b) the DNA compound of claim 1 positioned for expression from said activating sequence; and

(2) culturing said host cell transformed in step (1) under conditions that allow for gene expression.

4,892,820

SOLVENT SYSTEM FOR ENZYMATIC COUPLING PROCESS

John B. Hill, Woodstock, and Steven O. Rozcniak, Chicago, both of Ill., assignors to The Nutrasweet Company, Deerfield, Ill.

Filed Jun. 10, 1987, Ser. No. 60,286

Int. Cl.[4] C12P *21/02, 21/04*

U.S. Cl. 435—68.1 **20 Claims**

1. In an enzymatic coupling process for coupling amino acids and/or amino acid esters and derivatives, the improvement which comprises:

an alkylphosphate as a solvent or cosolvent.

4,892,821

METHOD FOR PREPARING VITAMIN D COMPOUNDS

Sadafumi Omura, Ageo; Joji Sasaki, Omiya; Akiko Mikami, and Kazutoshi Mizoue, both of Urawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Jul. 5, 1988, Ser. No. 215,316

Claims priority, application Japan, Jul. 8, 1987, 62-170669; Dec. 26, 1987, 62-331323

Int. Cl.[4] C12P *15/00;* **A61K** *31/59;* **C12R** *1/04, 1/465*

U.S. Cl. 435—127 **10 Claims**

1. A method for preparing a 1α- or 25-hydroxyvitamin D compound which comprises adding a vitamin D compound having a hydrogen atom at the 1α- or 25-position to a reaction mixture containing a mycelium of Actinomycetales being capable of hydroxylating the vitamin D compound or to a reaction mixture containing the enzyme produced from said mycelium and converting the hydrogen atom into a hydroxyl group.

4,892,822

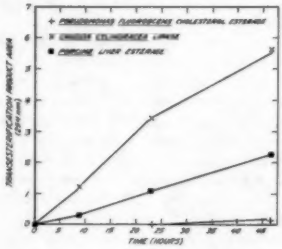
ENZYME-CATALYZED REACTIONS INVOLVING DIPHENYL CARBONATE

Daniel A. Abramowicz, Ballston Spa, and Charles R. Keese, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

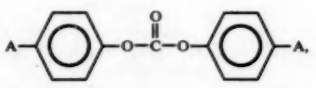
Filed Oct. 22, 1987, Ser. No. 111,248

Int. Cl.[4] C12P *7/00;* **C08G** *63/62*

U.S. Cl. 435—132 **19 Claims**



1. A method for performing an exchange reaction with a diphenyl carbonate compound of the formula



wherein each A is individually selected from the group consisting of hydrogen, lower alkyl groups, lower alkoxy groups, and halogens, comprising the reaction of the diphenyl carbonate compound with water or an alcohol in the presence of an enzymatic catalyst having an active site capable of binding the diphenyl carbonate while retaining a catalytic residue after binding.

17. A method for the preparation of polycarbonates, comprising the transesterification of a diphenyl carbonate compound with a dihydric phenol in the presence of an enzymatic catalyst selected from the group consisting of *Candida Cylindracea* lipase, Porcine liver esterase, Rhizopus lipase, and *Pseudomonas Fluorescens* cholesterol esterase.

4,892,823

METHOD FOR PRODUCING 2-KETO-L-GULONIC ACID

Ko Imai, Minoo; Takeshi Sakane, Suita, and Ikuo Nogami, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 4, 1987, Ser. No. 57,979

Claims priority, application Japan, Jun. 5, 1986, 61-131121

Int. Cl.[4] C12R *1/38;* **C12P** *7/60*

U.S. Cl. 435—138 **7 Claims**

1. A method for producing 2-keto-L-gulonic acid which comprises contacting L-sorbose with a microorganism of *Pseudomonas sorbosoxidans* which is able to oxidize L-sorbose to 2-keto-L-gulonic acid or a processed material thereof to produce and accumulate 2keto-L-gluonic acid and harvesting the same.

4,892,824

FAST TRACK METHOD FOR PRODUCING MONOCLONAL BI-SPECIFIC IMMUNOGLOBULINS

Eileen Skaletsky, San Diego, Calif., assignor to Synbiotics Corporation, San Diego, Calif.

Filed Mar. 15, 1988, Ser. No. 168,378
Int. Cl.[4] C12N *15/00, 5/00, 33/53;* C12R *1/91*
U.S. Cl. 435—172.2 13 Claims

1. A fast track method for producing one or more polyomas which express a desired bi-specific immunoglobulin having specificities for a first known hapten or antigen and a second known hapten or antigen, the first hapten or antigen being different from the second hapten or antigen, the method comprising the following steps:

Step A: obtaining a first sample of antibody expressing cells which express a first immunoglobulin having a specificity for the first hapten or antigen; Step B: obtaining a second sample of antibody expressing cells which express a second immunoglobulin having a specificity for the second hapten or antigen; Step C: obtaining a sample of myeloma cells which are selectable and which are fusible with the antibody expressing cells of the first and second samples; then Step D: combining the sample of myeloma cells with the first and second samples of antibody expressing cells so as to form a cell mixture; then Step E: forming cellular fusion products by the addition of a fusing agent to the cell mixture, the cellular fusion products including one or more polyomas created by substantially simultaneously fusing one myeloma cell, one antibody expressing cell from the first sample, and one antibody expressing cell from the second sample; and then Step F: selecting, from among the cellular fusion products, one or more polyomas which express the bispecific immunoglobulin.

4,892,825

IMMOBILIZATION OF BIOLOGICALLY ACTIVE MATERIAL WITH GLUTARALDEHYDE AND POLYAZETIDINE

Mogens Wumpelmann, Herlev, and Henrik Mollgaard, Lyngby, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. No. 874,141, Jun. 13, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 213,773
Claims priority, application Denmark, Jun. 14, 1985, 2692/85
Int. Cl.[4] C12N *11/08, 11/02, 11/04*
U.S. Cl. 435—180 18 Claims

1. A process for forming polyazetidine cross-linked immobilized biologically active materials in particle form which consists essentially of:

partially cross-linking an aqueous dispersion or solution of a biologically active material with glutaraldehyde, to produce a two phase system of flocculated partially cross-linked solids containing said biologically active material and water, dewatering said two phase system and recovering the solids as a wet pasty mass,

sub-dividing said pasty mass into discrete particles each of which is essentially homogeneous adding a polyazetidine prepolymer before, or at the beginning of partially cross-linking or subsequent thereto but prior to subdividing said pasty mass into particles, and

thereafter curing said particles whereby said polyazetidine prepolymer undergoes cross-linking.

4,892,826

PROCESS FOR THE PREPARATION OF UROKINASE DERIVATIVES

Gene A. Homandberg, Evanston, and Thanda Wai, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 11, 1988, Ser. No. 255,681
Int. Cl.[4] C12N *9/00*
U.S. Cl. 435—183 13 Claims

1. A process for the preparation of urokinase derivatives, the process comprising:

(a) saturating a parent urokinase molecule with arginine;

(b) reacting the saturated parent urokinase molecule in arginine with an amount of reducing agent sufficient to reduce the parent urokinase molecule to a reduced urokinase molecule by reducing three disulfide bridges;

(c) removing the reducing agent; and

(d) reacting the reduced urokinase molecule with from at least about 15 to about 30 molar excess of a desired compound having a sulfhydryl containing group.

4,892,827

RECOMBINANT PSEUDOMONAS EXOTOXINS: CONSTRUCTION OF AN ACTIVE IMMUNOTOXIN WITH LOW SIDE EFFECTS

Ira H. Pastan, Potomac; Sankar Adhya, Gaithersburg, and David Fitzgerald, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 24, 1986, Ser. No. 911,227
Int. Cl.[4] C12P *21/00, 21/02;* C12N *9/10;* A61K *34/00*
U.S. Cl. 435—193 10 Claims

1. A modified Pseudomonas exotoxin which comprises ADP ribosylating activity and the ability to translocate across a cell membrane; wherein the exotoxin comprises a deletion in the receptor binding domain Ia of the native toxin sufficient to render the modified toxin less toxic to human or animal cells in vitro and less toxic to the liver when administered in vivo relative to an unmodified Pseudomonas exotoxin.

4,892,828

MONOCLONAL ANTIBODY FOR HUMAN HEMATOPOIETIC GLYCOPROTEINS AND METHOD

Bo Dupont, Harrison, N.Y.; Yasuo Morishima, Nagoya, Japan; Nancy Collins, Larchmont, N.Y.; Shun-ichiro Ogata, Kagoshima, Japan, and Kenneth O. Lloyd, Bronx, N.Y., assignors to Sloan-Kettering Institute For Cancer Research, New York, N.Y.

Continuation of Ser. No. 509,201, Jun. 29, 1983, Pat. No. 4,710,457. This application Nov. 16, 1987, Ser. No. 120,608
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[4] C12N *15/00*
U.S. Cl. 435—240.27 2 Claims

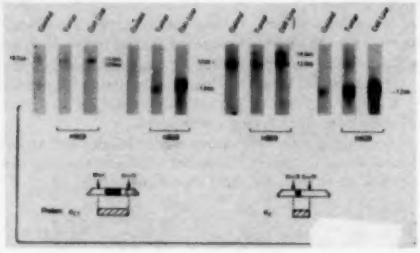
1. Hybridoma cell line ATCC No. HB 8311.

4,892,829

HUMAN PLASMA CELL LINE HAVING REARRANGED C-MYC PROTO-ONCOGENE

Adi F. Gazdar, Potomac, and Herbert K. Oie, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Apr. 22, 1986, Ser. No. 854,493
Int. Cl.[4] C12N 5/00, 15/00; C12R 1/91
U.S. Cl. 435—240.2 5 Claims



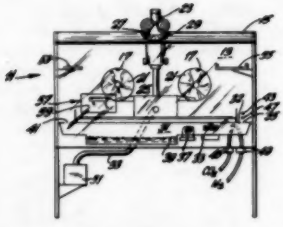
1. A cultured, human plasma cell myeloma line, having a rearranged c-myc gene and having the characteristics of ATCC CRL 9068.

4,892,830

ENVIRONMENTALLY CONTROLLED IN VITRO INCUBATOR

William Findley, and William E. Gibbons, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Apr. 2, 1987, Ser. No. 36,061
Int. Cl.[4] C12M 1/38
U.S. Cl. 435—290 19 Claims



1. An environmentally controlled incubator, comprising:

(a) an environmentally closed chamber including an enclosure having a transparent portion, said transparent portion including means for strongly attenuating transmission of light below a predetermined wavelength for preventing damage to culture media and biological materials within said chamber;

(b) means for positioning a microscope stage having a microscope mounting thereon within said chamber;

(c) a first aperture for permitting a microscope mounted on said stage to extend through said aperture;

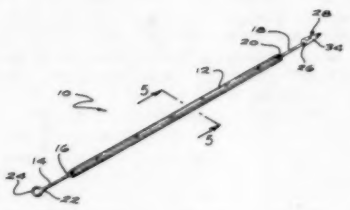
(d) second and third apertures within said enclosure positioned for allowing one using a microscope mounted on said microscope stage to manipulate things within said chamber, and sealing means for minimizing leakage between said chamber and the external ambient in the annuli between the edges of the said apertures and the microscope and forearms or hands of a user.

4,892,831

INOCULATING DEVICE

Johnson N. S. Wong, Rolling Hills, Calif., assignor to Evergreen Industries, Inc., Los Angeles, Calif.

Filed Dec. 19, 1988, Ser. No. 286,248
Int. Cl.[4] C12M 1/26
U.S. Cl. 435—292 19 Claims



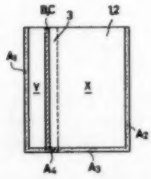
1. A streaking device for use upon bacteriological samples comprising a handle, a first end of said handle and a pyramidal shaped head disposed on said first end, said pyramidal shaped head having a base, at least three distinct streaking surfaces which are convexly shaped in a lateral direction parallel to said base for streaking bacteriological samples, and an apex for isolating and transferring selected bacterial colonies from one culture medium to another.

4,892,832

FILTER BAG FOR MICROBIOLOGICAL EXAMINATION

Kiyotaka Omote; Yuichi Matsushima; Masami Taki; Harutomo Oshio, and Kazuo Shiraishi, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Dec. 2, 1987, Ser. No. 127,651
Claims priority, application Japan, Dec. 5, 1986, 61-187582; Dec. 5, 1986, 61-187583
Int. Cl.[4] C12M 1/12
U.S. Cl. 435—311 8 Claims



1. A filter bag for microbiological examination comprising, opposed sidewalls sealed along the side and bottom edges thereof to form an interior space, and unsealed along the top edges thereof to form an opening inlet, and a filter sheet extending from a top end located at said opening inlet to a bottom end located at the sealed bottom edges of said sidewalls, and attached along one edge thereof to one of said sidewalls and along an opposite edge thereof to another of said sidewalls so as to divide said interior space formed by said sidewalls into two sections, said filter sheet being permeable to a liquid but impermeable to a solid material.

7. A package of filter bags for microbiological examination comprising an outer bag, and a plurality of said filter bags within said outer bag, said package of filter bags having been sterilized, and wherein each of said filter bags comprises opposed sidewalls sealed along the side and bottom edges thereof to form an interior space, and unsealed along the top edges thereof to form an opening inlet, and a filter sheet extending from a top end located at said opening inlet to a bottom end

located at the sealed bottom edges of said sidewalls, and attached along one edge thereof to one of said sidewalls and along an opposite edge thereof to another of said sidewalls so as to divide said interior space formed by said sidewalls into two sections, said filter sheet being permeable to a liquid but impermeable to a solid material.

4,892,833

PROCESS AND A REAGENT KIT FOR THE DETERMINATION OF DIRECT AND TOTAL FILIRUBIN

Ludwig Weiss, Munich, and Georg-Erich Hoffman, Grafrath, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,221

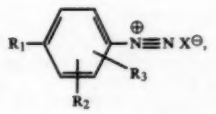
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225331

Int. Cl.[4] C01N *33/72*

U.S. Cl. 436—97 **13 Claims**

1. A process for the determination of bilirubin in body fluids, comprising the steps of

adjusting the pH of a first test solution sample with a buffer to a pH range of 4.3 to 5.7 and thereafter coupling the bilirubin with a diazonium salt of the formula:



(I)

in which R_1 is a hydrogen or halogen atom or a lower alkyl, lower alkoxy or benzolyamino radical, R_2 is a hydrogen atom or a lower alkyl or lower alkoxy radical, R_3 is a hydrogen or halogen atom or a lower alkyl or lower alkoxy radical, whereby R_1 and R_3 do not simultaneously represent halogen atoms, and X is an anion forming a storage-stable salt with the diazonium cation, to determine direct bilirubin; and

adjusting the pH of a second test solution sample to a pH range from 6 to 7 and thereafter coupling the bilirubin with said diazonium salt in the absence of caffeine and sodium benzoate additives, to determine total bilirubin;

determining the difference between total and direct bilirubin as a measure of the amount of indirect bilirubin present.

4,892,834

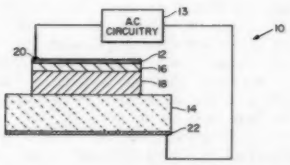
CHEMICAL SENSOR

R. David Rauh, Newton, Mass., assignor to EIC Laboratories, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 894,285, Aug. 7, 1986, abandoned. This application Sep. 3, 1987, Ser. No. 92,458

Int. Cl.[4] G01N *27/00*

U.S. Cl. 436—149 **25 Claims**



3. A sensor for detecting a chemical substance comprising an insertion element comprising a compound selected from the group consisting of IRO_2 and HfS_2 having a structure which enables insertion of said chemical substance with a resulting change in the bulk electrical characteristics of said insertion element; and

detecting means for measuring the change in said bulk electrical characteristics as an indication of the presence of said chemical substance.

17. A method for detecting a chemical substance comprising the steps of

providing a sensor comprising an insertion element comprising a compound selected from the group consisting of IrO_2 and HfS_2;

contacting said sensor with said chemical substance under conditions sufficient to permit effective insertion, whereupon said chemical substance inserts into the bulk of said insertion element and causes the bulk electrical characteristics of said insertion element to change; and

detecting said change in said bulk electrical characteristics of said insertion element as an indication of the presence of said chemical substance.

4,892,835

METHOD OF MANUFACTURING A FIELD EFFECT TRANSISTOR

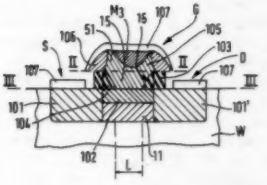
Patrick D. Rabinzohn, Saint-Maurice; Christian Rocher, Sucy-en-Brie, and Serge Gourrier, Lognes, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

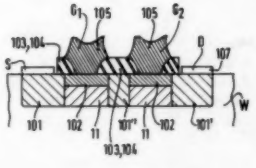
Filed Mar. 23, 1988, Ser. No. 171,990

Claims priority, application France, Mar. 24, 1987, 87 04072

Int. Cl.[4] H01L *21/265, 21/283, 21/314, 29/80*

U.S. Cl. 437—22 **22 Claims**





1. A method of manufacturing a field effect transistor semiconductor device comprising the steps of

(a) forming a substrate of a monocrystalline semiconductor material, said substrate having a surface orientated parallel to a crystallographic plane of said semiconductor material,

(b) forming a first layer of a first dielectric material at said surface,

(c) forming at least one first mask on said first layer

(d) etching said first layer relative to said first mask by reactive ion etching to obtain at least one first dielectric area of said first layer having a shape of said first mask, said first mask being disposed on said first dielectric area,

(e) forming a second mask at a spacing around said first dielectric area to expose portions of said substrate through a first opening,

(f) implanting ions into said substrate through said first opening to form source and drain regions of a first conductivity

in said substrate, said source and drain regions having a first resistivity different from a resistivity of said substrate,

(g) removing said second mask,

(h) forming at least one second layer over each of said first layer, said source and drain regions, and said substrate, said second layer being a second dielectric material with a uniform thickness, said uniform thickness of said second layer being at least equal to a thickness of said first dielectric area,

(i) planarizing the semiconductor device to said thickness of said first dielectric area to expose said first dielectric area,

(j) reactive ion etching said first dielectric area down to said substrate to form at least one second opening through said second layer to said substrate,

(k) implanting ions into said substrate through said second opening to form at least one active layer of said first conductivity, said active layer having a second resistivity different from said source and drain regions,

(l) forming first spacers in said second opening at edges of said second layer, said first spacers being made of said second dielectric material, and said first spacers reducing dimensions of said second opening to a length L,

(m) depositing gate metal layer in said at least one second opening to a thickness exceeding said second dielectric material, said gate metal layer extending over said second dielectric material at a uniform thickness, and said gate metal layer having a depression at said second opening,

(n) depositing a further layer over said gate metal layer to a further uniform thickness, said further layer being selected from the group consisting of titanium (Ti) and said first dielectric material,

(o) planarizing said semiconductor device down to said gate metal layer, a portion of said further layer remaining in said depression,

(p) etching said gate metal layer around said portion of said further layer down to said second layer by one of selective reactive ion etching and a beam of ions of a neutral gas, said portion acting as a third mask to form at least one gate electrode having said length L,

(q) forming second spacers on exposed edges of said gate electrode to form a peripheral dielectric part around said gate electrode at right angles to said second layer, said peripheral dielectric part being of said first dielectric material, and

(r) etching said second layer down to said surface of said substrate to expose said source and drain regions and said substrate by selective reactive ion etching, said etching being prolonged to laterally etch under said peripheral dielectric part.

4,892,836

METHOD FOR MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUITS INCLUDING CMOS AND HIGH-VOLTAGE ELECTRONIC DEVICES

Antonio Andreini, Milan; Claudio Contiero, Buccinasco, and Paola Galbiati, Monza, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

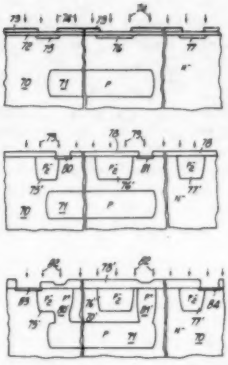
Filed Mar. 23, 1987, Ser. No. 28,842

Claims priority, application Italy, Mar. 27, 1986, 19906 A/86

Int. Cl.[4] H01L *21/70, 21/76*

U.S. Cl. 437—29 **5 Claims**

1. In a method for manufacturing semiconductor integrated circuits comprising a CMOS device and a high voltage electronic device, the CMOS device including an N-channel transistor having a P-well region and said high voltage electronic device having a border region in which an extended border portion is diffused to withstand the high voltage, the only step of simultaneously implanting the P-well region and at least one part of said extended border portion at said border region, by implanting impurities having a P-type conductivity and a pre-



set concentration with a protective mask obtained through a single photolithographic step.

4,892,837

METHOD FOR MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

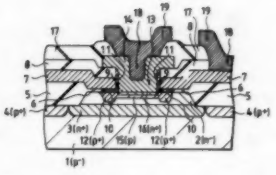
Satoshi Kudo, Maebashi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,032

Claims priority, application Japan, Dec. 4, 1987, 62-308446; Jan. 18, 1988, 63-8134

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—31 **22 Claims**



1. A method for manufacturing a semiconductor integrated circuit having a bipolar transistor in which an emitter electrode in led out from a region surrounded by a base electrode, comprising the steps of:

(a) successively forming a first insulating film, a base electrode forming layer including a silicon film as a principal constituent and a second insulating film on a principal surface of a silicon substrate;

(b) patterning said base electrode forming layer by an anisotropic etching process to form a base electrode;

(c) side-etching said first insulating film underneath the end portion of said base electrode on the side thereof which is closer to an emitter electrode forming region which is surrounded by said base electrode by an isotropic etching process to form an under cut portion;

(d) depositing a silicon film on the whole surface of said substrate in such a manner that said undercut portion is filled with said silicon film;

(e) forming said silicon film into a third insulating film except for that part of said silicon film which is buried in said undercut portion;

(f) removing said third insulating film from the emitter electrode forming region by etching to expose the surface of

said silicon substrate, the removing of the third insulating film being performed by anisotropic etching; and

(g) forming an emitter electrode on the exposed surface of said silicon substrate.

4,892,838

METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR

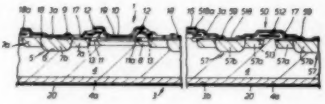
Carole A. Fisher, Horley, and David H. Paxman, Redhill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1988, Ser. No. 197,542

Claims priority, application United Kingdom, Jun. 8, 1987, 8713383

Int. Cl.[4] H01L *21/425, 29/78*

U.S. Cl. 437—41 **8 Claims**



1. A method of manufacturing a semiconductor device comprising a lateral insulation gate field effect transistor, which method comprises defining an insulated gate structure on a given surface of a semiconductor body having a first region of one conductivity type adjacent the given surface by providing an insulating layer on the given surface having a relatively thin region on a first area of the given surface adjoining a relatively thick region on a second area of the given surface and providing a conductive layer on the insulating layer to define an insulated gate over the first area of the given surface, with the conductive layer extending up onto the relatively thick region of the insulating layer, opening a window in the conductive layer on the relatively thick region of the insulating layer overlying the second area, etching the insulating layer isotropically through the window in the conductive layer to form a window in the relatively thick region of the insulating layer thereby leaving part of the conductive layer overhanging the edge of the window in the insulating layer, selectively etching the conductive layer with at least the area of the conductive layer spaced from the window masked so as to remove the part overhanging the edge of the window in the insulating layer, and introducing impurities into the semiconductor body using the insulated gate structure as a mask to form a source region of the one conductivity type aligned with the insulated gate and a drain region of the one conductivity type spaced from the source region and aligned with the window in the relatively thick region of the insulating layer.

4,892,839

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH POLYSILICON RESISTORS AND FIELD PLATE

Shinichi Ito, and Hirokazu Kaneda, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,533

Claims priority, application Japan, Nov. 28, 1986, 61-283727

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—47 **2 Claims**

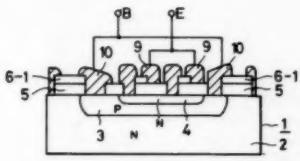
1. A method of manufacturing a semiconductor device with polysilicon resistors in which a base of a second conductivity type is provided in a semiconductor substrate of a first conductivity type, said semiconductor substrate of said first conductivity type being a collector, an emitter of said first conductivity type being provided in said base, pn junctions between said collector and said base being exposed on a surface of said semiconductor substrate, and said emitter being provided with low resistance stabilizing resistors, comprising the steps of:

providing a silicon oxide film on said surface of said substrate;

providing a polysilicon film on portions of said silicon oxide film above at least said emitter and said pn junctions between said collector and said base;

providing a resist film on said polysilicon film;

removing a portion of said resist film located above said emitter so that said resist film remains in place above said pn junctions between said collector and said base;



implanting ions having said first conductivity type into the portions of said polysilicon film above said emitter where said resist film has been removed;

heating said polysilicon film to diffuse said ions only into said portion of said polysilicon film above said emitter; and

photoetching said polysilicon film and said silicon oxide film so as to form said low resistance stabilizing resistors above said emitter and high resistance films above said pn junctions between said collector and said base.

4,892,840

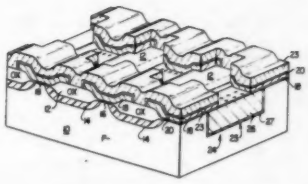
EPROM WITH INCREASED FLOATING GATE/CONTROL GATE COUPLING

Agerico L. Esquivel, Dallas, Tex.; Robert Groover, III, Arlington, Va., and Howard L. Tigelaar, Allen, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 96,176, Sep. 11, 1987, which is a continuation-in-part of Ser. No. 844,915, Mar. 27, 1986, Pat. No. 4,698,900. This application Apr. 11, 1989, Ser. No. 336,265

Int. Cl.[4] H01L *21/269*

U.S. Cl. 437—52 **16 Claims**



1. A method for fabricating a non-volatile memory array, comprising the steps of:

forming a plurality of bit line diffusions overlaid by bit line insulators near the surface of a semiconductor body to define channel regions in said semiconductor body located between said bit line diffusions;

etching away portions of said semiconductor body on opposing sides of said channel regions to define trenches having a depth at least half that of said bit line diffusion;

filling said trenches with a dielectric;

depositing over said semiconductor body and patterning a first insulated conductive layer to form conductive strips;

depositing over said first insulated conductive layer a second insulated conducting layer; and

etching said second conductive layer to form word lines which are not parallel to said bit line diffusions, while also etching away portions of said first conductive layer which

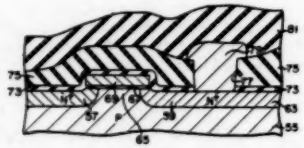
do not underlie portions of said second conductive layer, and etching said first and second layers in a pattern so that at least a portion of said layers overlie said dielectric-filled trenches.

4,892,841

METHOD OF MANUFACTURING A READ ONLY SEMICONDUCTOR MEMORY DEVICE

Taira Iwase, Kawasaki; Shoji Arizumi, Tokyo, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 942,807, Dec. 22, 1986, abandoned, which is a division of Ser. No. 674,999, Nov. 27, 1984, abandoned. This application Oct. 11, 1988, Ser. No. 256,266
Claims priority, application Japan, Nov. 29, 1983, 58-224921
Int. Cl.[4] H01L 21/70, 21/00
U.S. Cl. 437—52 10 Claims



1. A method of manufacturing memory cells in a semiconductor memory device comprising the steps of:

preparing a semiconductor body;

forming MOS transistors, all of said transistors having a gate region, a source region, a drain region, and a gate electrode in said semiconductor body, a completed channel and a field oxide film defining an element region of said semiconductor body on said semiconductor body;

forming a first insulation layer to cover said MOS transistors;

forming a first contact hole for each of the transistors in said first insulation layer so as to extend to the drain region of each said MOS transistors;

forming a polycrystalline silicon layer for each of the transistors over said MOS transistors except over at least a portion of the gate region of said MOS transistors, said silicon layer extending over said field oxide film, but not over the adjacent transistors, and into the first contact hole, and directly contacting the drain region of said MOS transistors;

forming a second insulation layer on at least said polycrystalline silicon layer;

forming a second contact hole in said second insulation film, said second contact hole being formed on a portion of said polycrystalline silicon layer over said field oxide film;

forming a metal wire layer over said MOS transistors except over at least a part of said gate region of said MOS transistors and connected to said polycrystalline silicon layer via said second contact hole to transmit output signals of said MOS transistors; and

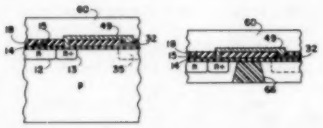
implanting ions into the gate region of said MOS transistors through said gate electrode to vary the threshold voltage after said metal wire layer is formed, thereby to write data in said MOS transistors.

4,892,842

METHOD OF TREATING AN INTEGRATED CIRCUIT

Brian L. Corrie, Gaston; Morley M. Blouke, Beaverton, and Denis L. Heidtmann, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 29, 1987, Ser. No. 114,884
Int. Cl.[4] H01L 21/76, 21/82
U.S. Cl. 437—67 11 Claims



1. A method of treating an integrated circuit formed in a semiconductor die having a front face and a back face, the die having at least two distinct functional regions that are electrically connected together, comprising the steps of:

mounting the die by way of its front face on a support member, and

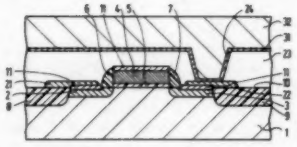
removing material of the die by way of the back face so as to separate the functional regions of the die from each other without disconnecting the functional regions from each other.

4,892,843

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Johannes E. J. Schmitz; Antonius J. M. Van Dijk, and Russell C. Ellwanger, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 28, 1988, Ser. No. 290,921
Claims priority, application Netherlands, Jan. 29, 1988, 8800221
Int. Cl.[4] H01L 21/00, 21/02, 21/31, 21/60
U.S. Cl. 437—192 14 Claims



1. A method of manufacturing a semiconductor device comprising the steps of

first forming a first tungsten layer on a substrate by reducing tungsten hexafluoride with silane in the gaseous phase and in the absence of a separate supply of hydrogen gas, said silane having a mole fraction smaller in the supply to the gaseous phase than a mole fraction of said tungsten hexafluoride, and

thereafter forming a further tungsten layer over said first tungsten layer by reducing tungsten hexafluoride with only hydrogen gas.

4,892,844

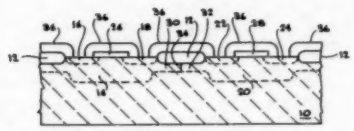
MAKING A LOW RESISTANCE THREE LAYERED CONTACT FOR SILICON DEVICES

Robin W. Cheung, Cupertino; Bernard W. K. Ho, Fremont; Hsiang-Wen Chen, Cupertino, and Hugo W. K. Chan, Fremont, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 858,994, May 2, 1986, Pat. No. 4,796,081. This application Dec. 16, 1988, Ser. No. 285,188

Int. Cl.[4] H01L *21/00, 21/02, 21/90, 21/306*

U.S. Cl. 437—194 8 Claims



1. A process for forming an improved metal contact to conducting regions of a silicon-based semiconductor device formed on a surface of a silicon substrate, said contact formed through openings in a dielectric layer to said conducting regions underlying said dielectric layer, said process comprising:

(a) forming a composite metal contact comprising

(1) forming a first layer of a refractory metal silicide everywhere on said dielectric layer, including in said openings,

(2) forming a second layer of aluminum on said refractory metal silicide,

(3) forming a top layer of a refractory metal silicide on said layer of aluminum;

(b) patterning said composite contact; and

(c) sintering said composite contact.

4,892,845

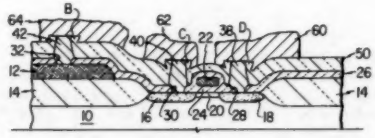
METHOD FOR FORMING CONTACTS THROUGH A THICK OXIDE LAYER ON A SEMICONDUCTIVE DEVICE

Jeffrey M. Bridges, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1984, Ser. No. 646,559

Int. Cl.[4] H01L *21/316*

U.S. Cl. 437—195 9 Claims



1. A method for forming contacts with semiconductor substrates, comprising:

(a) providing a semiconductor substrate;

(b) forming a thin oxide layer on the surface of the substrate;

(c) patterning openings in said thin oxide layer to allow access to desired contact areas thereon;

(d) forming conducting contacts in the formed openings extending upward from the substrate;

(e) depositing a layer of thick oxide on the substrate to cover the thin oxide layer and formed contacts, the height above said substrate of the formed contacts being approximately equal to the thickness of the thick oxide layer; and then

(f) selectively etching the resulting layer to remove only the portion of the thick oxide covering the upper surface of the formed contacts.

4,892,846

REINFORCEABLE SINTERED GLASS-CERAMICS

Philip S. Rogers, Rickmansworth; Rees D. Rawlings, Kingston-upon-Thames, and Hyung S. Kim, London, all of England, assignors to National Research Development Corporation, London, England

Filed Nov. 17, 1988, Ser. No. 272,343

Int. Cl.[4] C03C *10/04, 10/06*

U.S. Cl. 501—8 11 Claims

1. A method of making a ceramic material comprising a primary crystalline phase of diopside and about 5 to 30 weight % anorthite, said method comprising the steps of:

forming a homogeneous glass powder having a composition in parts by weight: $CaO+MgO+Al_2O_3+SiO_2$ totalling 100 in proportions

(0–30):(0–30):(5–35):(35–75) respectively, plus ½–3 Cr_2O_3 or a precursor of Cr_2O_3 to yield ½–3 Cr_2O_3, plus ½–10 Fe_2O_3 or a precursor of Fe_2O_3 to yield ½–10 Fe_2O_3, and of a particle size not exceeding 70 μm; and

heating the powder so as to sinter and crystallize it in the same heating.

4,892,847

LEAD-FREE GLASS FRIT COMPOSITIONS

Barry P. Reinherz, Lawrence, Pa., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 13, 1988, Ser. No. 206,250

Int. Cl.[4] C03C *8/02, 3/064*

U.S. Cl. 501—14 6 Claims

1. A lead-free glass frit composition consisting essentially of the following components in the indicated weight percent amounts:

SiO_2: 25–35
Bi_2O_3: 25–43
B_2O_3: 12–25
alkali metal oxide: 4–19
ZrO_2: 0–3
TiO_2: 0–5
ZnO: 0–6
CaO: 0–4
SrO: 0–15
BaO: 0–19
Al_2O_3: 0–4
NO_2: 0–10
WO_3: 0–1
Ce_2O_3: 0–1.5
Cr_2O_3: 0–7
CoO: 0–15
MnO: 0–8
P_2O_5: 0–10

with the amount of ZrO_2+TiO_2 being 0.3–8.

4,892,848

SILICON NITRIDE SINTERED BODY AND PROCESS FOR PREPARATION THEREOF

Makoto Yoshida, and Kiyoshi Yokoyama, both of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jul. 29, 1986, Ser. No. 891,854

Claims priority, application Japan, Jul. 30, 1985, 60-169177

Int. Cl.[4] C04B *35/58*

U.S. Cl. 264—65 16 Claims

16. A process for preparation of a silicon nitride sintered body, which process comprises (i) molding a composition comprising (a) silicon nitride and (b) 2 to 13% by weight of a sintering aid, said sintering aid comprising an oxide or nitride of an element of group IIIa of the Periodic Table and an inorganic oxide capable of forming a liquid phase component having a melting point lower than that of silicon nitride, the inorganic oxide being present in an amount of up to 7% by weight base on the composition, thereby forming a molded body; (ii) sintering the molded body in a non-oxidizing atmosphere at a first temperature within the range of 1650° and

1800° C. and sufficient to form a liquid phase comprising said liquid phase component, thereby forming a sintered body; and (iii) heat-treating the sintered body in a non-oxidizing atmosphere at a second temperature within the range of 1900° and 2000° C., whereby volatilization of the liquid phase component is promoted, said heat-treating being carried out (1) while forcibly substituting non-oxidizing gas in the atmosphere to maintain vapor pressure of the liquid phase component in the atmosphere at a low level to form a final product or (2) so that oxygen content of the surface layer of the final product is lower than 3% by weight.

4,892,849

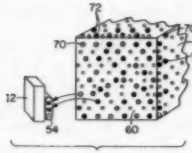
CERAMIC COMPOSITION HAVING LOW FRICTION COEFFICIENT AT HIGH OPERATING TEMPERATURES

James Lankford, Jr., San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 18,627, Feb. 25, 1987, Pat. No. 4,775,548. This application May 26, 1988, Ser. No. 198,936

Int. Cl.[4] C04B *35/48, 35/58*

U.S. Cl. 501—97 **4 Claims**



2. A stable ceramic material having a surface with a low coefficient of friction and a high wear resistance at high operating temperatures comprising:

a composite of a first metal ion selected from the group consisting of cobalt, nickel, titanium, niobium, silver, zinc, copper, zirconium and yttrium, a second metal ion selected from the group consisting of cobalt, nickel, titanium, niobium, silver, zinc, copper, zirconium and yttrium, said first metal ion being different than said second metal ion, and a ceramic composition selected from the group consisting of silicon nitride and zirconia, on a near surface region of said composition, said composite formed by ion mixing of said first metal ion having been ion implanted in said near surface region with said second metal ion having been ion implanted in said near surface region, said composite having been oxidized at high oxidizing temperatures to form an oxide gradient layer in said surface of said ceramic composition.

4,892,850

TOUGH CORUNDUM-RUTILE COMPOSITE SINTERED BODY

Saburo Hori, Tokyo, Japan, assignor to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,532

Claims priority, application Japan, Nov. 7, 1986, 61-265329

Int. Cl.[4] C04B *35/10, 35/46*

U.S. Cl. 501—127 **9 Claims**

1. A corundum-rutile composite sintered body of high toughness consisting essentially of alumina of corundum phase and titania of rutile phase, which contains alkali metal, existing in oxide form, in an amount of about 0.01 to 0.5 wt % and plate-shaped corundum particles whose cross sections having aspect ratios of about 2.5 or more are observed to be about 10 vol % or more by scanning electron microscopy, wherein the content of alumina is about 10 to 90 wt % and the remainder is substantially titania.

4,892,851

PROCESS AND CATALYST FOR PRODUCING SYNDIOTACTIC POLYOLEFINS

John A. Ewen, Houston, and Abbas Razavi, Seabrook, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed Jul. 15, 1988, Ser. No. 220,007

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—104 **12 Claims**

1. A metallocene catalyst for use in preparing syndiotactic polyolefins, said catalyst described by the formula $R''(CpR_n)(CpR'_m)MeQ_k$ wherein each Cp is a cyclopentadienyl or substituted cyclopentadienyl ring; each R_n is the same or different and is a hydrocarbyl radical having 1–20 carbon atoms; each R'_m is the same or different and is a hydrocarbyl radical having 1–20 carbon atoms; R'' is a structural bridge between the Cp rings imparting stereorigidity to the catalyst; Me is a group 4b, 5b, or 6b metal from the Periodic Table of Elements; each Q is a hydrocarbyl radical having 1–20 carbon atoms or is a halogen; $0 \leqq k \leqq 3$; $0 \leqq n \leqq 4$; $1 \leqq m \leqq 4$; and wherein R'_m is selected such that (CpR'_m) is a sterically different ring than (CpR_n).

9. The catalyst of claim 1 further comprising an aluminum compound selected from the group consisting of alumoxanes, alkyl aluminums and mixtures thereof.

4,892,852

TRANSITION METAL COMPOSITION

Roy J. Sampson, Guisborough; John W. Kelland, and Frank T. Kiff, both of Middlesborough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 13, 1988, Ser. No. 180,930

Claims priority, application United Kingdom, Apr. 13, 1987, 8708810

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—107 **10 Claims**

1. A transition metal composition which is the reaction product of a compound of a transition metal of Group IVA, VA or VIA of the Periodic Table with a magnesium compound of the general formula

$$Mg_x(R(COO)_y)_z$$

wherein

R is unsubstituted cycloalkyl or cycloalkyl substituted with one or more halogen atoms, alkyl groups containing 1 to 6 carbon atoms, or alkoxy groups containing 1 to 6 carbon atoms; and

x, y and z are integers such that $yz=2x$.

4,892,853

ETHYLENE POLYMERIZATION CATALYST

Kevin J. Caan; Frederick J. Karol, both of Belle Mead, N.J.; Kiu H. Lee, South Charleston, and Arthur E. Marcinkowsky, Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Sep. 30, 1988, Ser. No. 251,360

Int. Cl.[4] C08F *4/68*

U.S. Cl. 502—112 **18 Claims**

1. A vanadium catalyst composition comprising:

(i) the reaction product of a vanadium compound and an electron donor, which is a liquid, organic Lewis base in which the vanadium compound is soluble;

(ii) a hydrocarbyl aluminum cocatalyst; and

(iii) a promoter having the following formula;

$$C_3(X)_a(F)_b(H)_c$$

where X is chlorine, bromine, or iodine, and each X can be alike or different

a=an integer from 6 to 8

b=an integer from 0 to 2

c=an integer from 0 to 2

a+b+c=8

and wherein the molar ratio of promoter to vanadium has an upper limit of about 4:1, said composition exhibiting enhanced catalytic activity in the polymerization of ethylene alone or together with one or more other alpha olefins.

4,892,854

DISPERSIONS AND THE PREPARATION OF FOAMED RESINS THEREFROM

Ronald L. Pastorino, Larkspur, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Witco Corporation, New York, N.Y.

Filed Jan. 5, 1989, Ser. No. 293,890
Int. Cl.[4] C08J 9/08
U.S. Cl. 502—160 27 Claims

1. An aqueous dispersion for use in foaming and curing polyester resins comprising a symmetrical or asymmetrical aromatic diacyl peroxide; an alkali metal carbonate or bicarbonate or mixtures thereof; dispersion stabilizing amounts of magnesium aluminum silicate and alkali metal carboxymethyl cellulose; glycerol; and sufficient water to form an aqueous dispersion.

4,892,855

CATALYST AND METHOD FOR PRODUCING METHANOL FROM HYDROGEN AND CARBON MONOXIDE

Koichi Mizuno, Tsukuba; Masahiro Saito, Kawaguchi; Tadao Takahashi, Kitasoma, and Reize Aizawa, Ushiku, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan

Filed Aug. 30, 1988, Ser. No. 238,058
Claims priority, application Japan, Nov. 6, 1987, 62-281399
Int. Cl.[4] B01J 27/138
U.S. Cl. 502—200 4 Claims

1. A catalyst comprising a carrier of Li-taeniolite having the formula:

$$LiMg_2LiSi_4O_{10}F_2$$

and a catalytic component including palladium and carried by said carrier.

4,892,856

CATALYST FOR OXIDATION OF ACROLEIN AND PROCESS FOR PREPARATION THEREOF

Tatsuya Kawajiri; Shinichi Uchida, both of Himeji, and Masahiro Wada, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 1, 1988, Ser. No. 201,026
Claims priority, application Japan, Jun. 5, 1987, 62-139663
Int. Cl.[4] B01J 23/22, 23/28
U.S. Cl. 502—247 6 Claims

1. A catalyst for use in the production of acrylic acid by catalytic gas phase oxidation of acrolein, comprising active substances represented by general formula

wherein Mo represents molybdenum, V represents vanadium, A represents at least one element selected from the group consisting of tungsten and niobium, B represents at least one element selected from the group consisting of iron, copper, bismuth, chromium, antimony and thallium, C represents at least one element selected from the group consisting of alkali metals and alkaline earth metals, D represents at least one element selected from the group consisting of silicon, aluminum and titanium, and O represents oxygen; and further, a, b, c, d, e, f and x represents atomic ratios of Mo, V, A, B, C, D, and O respectively, and when a=12, then b=2 to 14, c=0 to 12, d? 0 to 6, e? 0 to 6 and f? 0 to 30 and x is a numerical value determined depending upon the oxidation states of the other elements, and said catalyst being prepared by charging an unfired catalyst material powder into a centrifugal flow coating apparatus to form particles, and firing the particles, wherein said particles are characterized by having a specific surface area of 0.50 to 15.0 m^2/g, a pore volume of 0.10 to 0.90 cc/g and a pore diameter distribution in which the pore diameters are distributed concentratedly in each of the ranges of from 0.1 to less than 1.0 μm, from 1.0 to less than 10.0 μm and from 10.0 to 100 μm.

4,892,857

ELECTRICALLY CONDUCTIVE CERAMIC SUBSTRATE

David L. Tennent, Lindley; Gerald D. Fong, Beaver Dams, and Christine L. Hoaglin, Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed May 20, 1987, Ser. No. 52,253
Int. Cl.[4] B01J 35/04
U.S. Cl. 502—439 14 Claims

1. An apparatus for use in a liquid-phase, gas-phase, or mixed-phase reaction consisting essentially of:

(a) a substrate selected from the group consisting of glass, glass-ceramic, ceramic, and a mixture thereof, said substrate further including a transition metal oxide, said substrate having thin walls with open porosity, wherein said thin walls define a plurality of cells extending substantially parallel through said substrate so as to be open at both ends for the flowable passage of liquids and gases;

(b) a first layer formed by diffusing at least a portion of said transition metal oxide to a position integral with the walls of said substrate; and

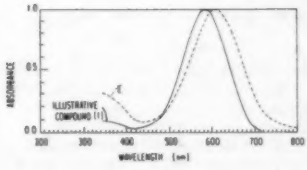
(c) a second metal-containing layer superposed on said first layer, wherein the combination of said first and second layers forms a substantially continuous conductive film having a resistivity of no greater than approximately 100 ohm-cm.

4,892,858

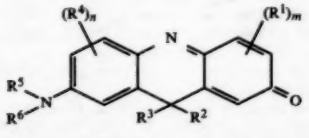
HEAT SENSITIVE TRANSFER MATERIALS

Takeshi Nakamine, and Kozo Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1988, Ser. No. 272,034
Claims priority, application Japan, Nov. 16, 1987, 62-288971
Int. Cl.[4] B41M 5/035, 5/26
U.S. Cl. 503—227 10 Claims



1. A heat sensitive transfer material comprising a support having provided thereon a layer containing a binder and a dye represented by formula (I)



(I)

wherein R^1 represents an aliphatic group which has from 4 to 10 carbon atoms, an aromatic group which has from 4 to 10 carbon atoms, an acyl group, an acyloxy group, an alkoxycarbonyl group, an acylamino group, a carbamoyl group, a sulfon-

amido group, a sulfamoyl group, an imido group, a urethane group, a ureido group, a sulfonyl group, a hydroxyl group, a cyano group, a carboxyl group, a nitro group or a halogen atom; m represents an integer of from 0 to 3; when m≧2 the R^1 groups may be the same of different and may be joined together to form a ring; R^2 and R^3 each independently represents an aliphatic group which has from 1 to 6 carbon atoms or an aromatic group which has from 4 to 10 carbon atoms, and R^2 and R^3 may be joined together to form a ring; R^4 represents a halogen atom, an alkoxy group, an aliphatic group which has from 1 to 6 carbon atoms or an aromatic group which has from 4 to 10 carbon atoms; n represents an integer of from 0 to 3; when n≧2 the R^4 groups may be the same or different; and R^5 and R^6 each independently represents a hydrogen atom, an aliphatic group which has from 1 to 6 carbon atoms, or an aromatic group which has from 4 to 10 carbon atoms, R^5 and R^6 may have substituent groups which contain hetero atoms, R^5 and R^6 may be joined together to form a ring, and R^5 and/or R^6 may be joined to R^4 to form a ring.

4,892,859

THERMAL TRANSFER PRINTING

Peter Gregory, Bolton, and Roy Bradbury, Widnes, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 28, 1988, Ser. No. 225,213

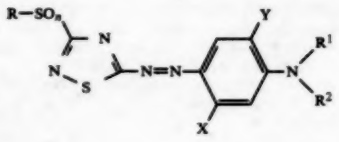
Claims priority, application United Kingdom, Jul. 30, 1987, 8718086; Oct. 2, 1987, 8723150

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] B41M *5/35, 5/26*

U.S. Cl. 503—227 **7 Claims**

1. A thermal transfer printing sheet comprising a substrate having a coating comprising a binder and a dye of the formula:



wherein:

R represents an optionally substituted alkyl, aryl or aralkyl radical;

n is one or 2;

X represents hydrogen, halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{1-4}-alkylthio, beta-cyanoethyl, C_{1-4}-alkylcarbonylamino or C_{1-4}-alkylsulphonylamino;

Y represents hydrogen or methoxy, and

each of R_1 and R_2 independently, represents allyl, C_{1-12}-alkyl or C_{1-4}-alkyl substituted by a group selected from cyano, C_{1-4}-alkoxycarbonyl, C_{1-4}-alkylcarbonyloxy, R^3CONH—, R^3NHCO— and R^3NHCOO— in which R^3 represents C_{1-4}-alkyl or optionally substituted aryl.

4,892,860

SLIPPING LAYER CONTAINING AMINO-MODIFIED SILOXANE AND ORGANIC LUBRICATING PARTICLES FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Noel R. Vanier, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 173,345, Mar. 25, 1988, abandoned. This application Nov. 18, 1988, Ser. No. 273,380

Int. Cl.[4] B41M *5/35, 5/26*

U.S. Cl. 503—227 **20 Claims**

10. In a process of forming a dye transfer image comprising

(a) imagewise-heating a dye-donor element comprising a support having on one side thereof a dye layer and on the other side a slipping layer comprising a lubricating material in a polymeric binder, said lubricating material comprising a linear or branched aminoalkyl-terminated poly(dialkyl, diaryl or alkylaryl siloxane), and

(b) transferring a dye image to a dye-receiving element to form said dye transfer image,

the improvement wherein said slipping layer also comprises organic lubricating particles.

4,892,861

LIQUID PHASE SINTERED SUPERCONDUCTING CERMET

Siba P. Ray, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 14, 1987, Ser. No. 85,959

Int. Cl.[4] C22C *29/12;* **H01L** *39/12*

U.S. Cl. 505—1 **10 Claims**

1. A method of making a super-conducting cermet having superconducting properties with improved bulk density, low porosity and in situ stabilization comprising the steps of:

(a) forming a structure of

(i) a superconducting ceramic material having the formula $RM_2Cu_3O_{(6.5+x)}$ wherein R is one or more rare earth elements capable of reacting to form a superconducting ceramic, M is one or more alkaline earth metal elements selected from barium and strontium capable of reacting to form a superconducting ceramic, x is greater than 0 and less than 0.5; and

(ii) a precious metal compound in solid form selected from the class consisting of oxides, sulfides and halides of silver; and

(b) liquid phase sintering the mixture at a temperature wherein the precious metal of the precious metal compound is molten and below the melting point of said ceramic material, the liquid phase sintering carried out for a time less than 36 hours but sufficient to improve the bulk density of the cermet.

4,892,862

PROCESS FOR PRODUCING SUPERCONDUCTING MATERIAL

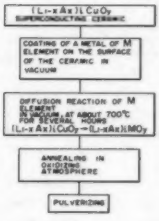
Tetsuya Ogushi; Yoshinori Hakuraku, both of Kagoshima, and Hisanao Ogata, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,097

Claims priority, application Japan, Apr. 13, 1987, 62-88847; May 18, 1987, 62-118844; May 18, 1987, 62-118846; Aug. 21, 1987, 62-206359; Aug. 21, 1987, 62-206360

Int. Cl.[4] H01L *39/24;* **C23C** *14/34*

U.S. Cl. 505—1 **11 Claims**


$(L_{1-x}A_x)_1CuO_y$
SUPERCONDUCTING CERAMIC
COATING OF A METAL OF M ELEMENT ON THE SURFACE OF THE CERAMIC IN VACUUM
DIFFUSION REACTION OF M ELEMENT IN VACUUM AT ABOUT 700°C FOR SEVERAL HOURS
$(L_{1-x}A_x)_1CuO_y \rightarrow (L_{1-x}A_x)_1MO_y$
ANNEALING IN OXIDIZING ATMOSPHERE
PULVERIZING

1. A process for producing a film of oxide superconducting material represented by the formula:

$$(L_xA_{1-x})_1MO_y \quad (1) \text{ or}$$

$$(L_xA_{1-x})_1M_{1-z}Cu_zO_y \quad (2)$$

wherein L is at least one element selected from the group consisting of Sc, Y, lanthanide elements of atomic numbers 57 to 71, and Li, Na, K, Rb, Cs and Fr belonging to the group Ia of the periodic table; A is at least one element selected from alkaline earth metal elements; M is at least one element selected from the group consisting of V, Nb, Ta, Ti, Zr and Hf; x is $0<x<1$; i is 1, 3/2 or 2; y is $0<y\leqq3$ in the case of i=1, or $0<y\leqq4$ in the case of i=3/2 or 2; and z is $0<z<1$, which comprises

depositing, on a metal film of one element selected from the group consisting of the elements L, A, and M, an oxide of the rest of the elements other than that of the metal film, and

heat treating the metal film and the resulting deposited layer to carry out a diffusion reaction therebetween.

4,892,863

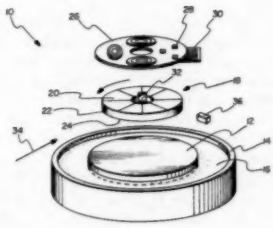
ELECTRIC MACHINERY EMPLOYING A SUPERCONDUCTOR ELEMENT

Ashok K. Agarwala, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1988, Ser. No. 251,621

Int. Cl.[4] H02K 9/00

U.S. Cl. 505—1 **29 Claims**



1. A machine comprising:

(a) a superconductor bearing;

(b) a magnetic rotor that can be positioned so that it can levitate and move with respect to the superconductor bearing and producing a first magnetic field; and

(c) a stator comprising an armature winding that is connectible to a source/sink of electrical power to produce a second magnetic field between the stator and the rotor, the first and second magnetic fields capable of interacting so as to create an electromagnetic torque, so that

when the machine is acting as a generator, the electromagnetic torque opposes rotation of the rotor, and

when the machine is acting as a motor, the electromagnetic torque acts in the direction of rotation.

4,892,864

PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING AS AN ACTIVE COMPONENT 10-ACETYL-1,8,9-TRIACETOXY ANTHRACENE

Braham Shroot, Antibes; Gérard Lang, Epinay-sur-Seine, and Jean Maignan, Tremblay les Gonesse, all of France, assignors to Centre International de Recherches Dermatologiques (C.I.R.D.), Valbonne, France

Continuation of Ser. No. 58,324, Jun. 4, 1987, abandoned, which is a continuation of Ser. No. 756,300, Jul. 18, 1985, abandoned. This application Feb. 8, 1988, Ser. No. 153,600

Claims priority, application France, Jul. 19, 1984, 84 11441

Int. Cl.[4] A61K 31/21, 7/06

U.S. Cl. 514—510 **6 Claims**

1. A pharmaceutical composition for the treatment of eczema, rheumatism, dermatosis, seborrhea, pellicular poll evil, sunburn, psoriasis or warts comprising in a pharmaceutically acceptable carrier from 0.01 to 70 percent by weight, based on the total weight of said composition of 10-acetyl-1,8,9-triacetoxy anthracene as the active component, said composition being in the form of tablets, granules, gelules and capsules.

4,892,865

PYRROLO[2,3-D]PYRIMIDINE NUCLEOSIDES AS ANTIVIRAL AGENTS

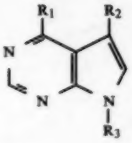
Leroy B. Townsend; John C. Drach, both of Ann Arbor, Mich., and Steven H. Krawczyk, Bellerose, N.Y., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Dec. 1, 1987, Ser. No. 127,487

Int. Cl.[4] A61K 31/52; C07H 19/14

U.S. Cl. 514—43 **17 Claims**

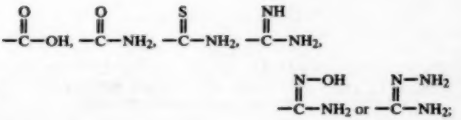
1. The method of treating human cells infected with a virus selected from the group consisting of herpes virus and cytomegalovirus, said method comprising the step of contacting said cells with a composition comprising a therapeutically effective amount of a compound selected from the group consisting of a compound of the following formula and pharmaceutically acceptable salts thereof:



where

R_1 is NH^2 or OH;

R_2 is H, CN,



and

R_3 is 2',3'-dideoxy-2',3'-didehydro-β-D-ribofuranose or 2',3'-dideoxyribofuranose.

4,892,866

STABILIZED PESTICIDAL COMPOSITION

Hanshelmut Itzel, Gau-Algesheim; Manfred Dewenter, Badenheim, and Siegfried Henke, Welgesheim, all of Fed. Rep. of Germany, assignors to Shell International Research Maatshappij B. V., The Hague, Netherlands

Filed Jul. 22, 1988, Ser. No. 223,078

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726339

Int. Cl.[4] A01N 57/00

U.S. Cl. 514—119 **4 Claims**

1. A pesticidal composition comprising, as active ingredient, a pesticidally effective amount of dimethoate together with at least one inert carrier therefor, characterized in that the composition contains a stabilizing effective amount of a stabilizer comprising a cyclopropene fatty acid, said stabilizer being selected from the group consisting of malvalic acid, sterculic acid, and oil from seeds of the kapok tree, from *Sterculia* species, from *Durio zibethinus*, from *Gretum gnemon* or from species of the *Malvaceae* family.

4,892,867

ANTIANDROGENIC 17-ALPHA-ALKYL STEROIDS

Rudolf Wiechert; Dieter Bittler; Annerose Schleusener, and Manfred Albring, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

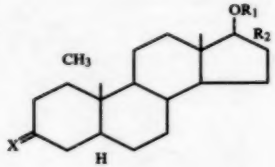
Continuation of Ser. No. 784,121, Oct. 4, 1985, abandoned, which is a division of Ser. No. 620,216, Jun. 13, 1984, Pat. No. 4,558,041, which is a division of Ser. No. 380,328, May 20, 1982, Pat. No. 4,456,600, which is a division of Ser. No. 198,383, Oct. 30, 1980, Pat. No. 4,344,941. This application Oct. 14, 1986, Ser. No. 918,231

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943776

Int. Cl.[4] A61K *31/56;* C07J *1/00*

U.S. Cl. 514—178 22 Claims

1. A 17α-substituted steroid of the formula



wherein

R_1 is hydrogen, an acyl group of a C_{1-17} hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, C_{1-5}-alkyl or C_{1-5}-alkenyl interrupted by an oxa atom, cyclopentyl or tetrahydropyranyl,

R_2 is C_{3-4}-alkyl, and

X is oxygen or $H(OR_3)$ wherein R_3 is hydrogen, an acyl group of a C_{1-17} hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, cyclopentyl or tetrahydropyranyl.

4,892,868

DERIVATIVES OF BILIARY ACIDS, PROCESS FOR THE PRODUCTION THEREOF AND CORRESPONDING PHARMACEUTICAL COMPOSITIONS

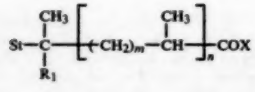
Virginio Castagnola, Milan; E. Giuliano Frigerio, Bresso; Roberto Pellicciari, Perugia, and Aldo Roda, Bologna, all of Italy, assignors to Gipharmex, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 641,741, Aug. 17, 1984, abandoned. This application Jul. 10, 1986, Ser. No. 884,003

Int. Cl.[4] A61K *31/575;* C07J *9/00*

U.S. Cl. 514—182 15 Claims

1. Compounds of formula I



(I)

wherein:

St represents a 17-ethiocholanyl group, having two or the hydroxy groups both in the α and β conformation, some of which may be replaced by keto groups;

m and n are zero or 1;

when n is 1, R_1 is hydrogen, whereas when n is zero, R_1 is methyl;

X represents hydroxy, OR_3 (where R_3 is a pharmaceutically acceptable cation), taurine or glycine groups of formula $—NH(CH_2)_2SO_3H$ and $—NH—CH_2—COOH$, which may be salified, and stereoisomers thereof.

12. A method for treating hepatobiliary functional disorders which comprises administering to a patient a therapeutically effective amount of the compound of claim 1.

15. A method for treating cholesterol gallstones which comprises administering to a patient a therapeutically effective amount of the compound of claim 1.

4,892,869

2-AZA SUBSTITUTED-1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

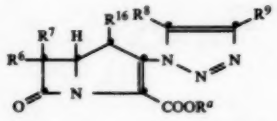
Burton G. Christensen, Cliffside Park; Ronald W. Ratcliffe, Matawan, and John C. Chabala, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 170,577, Mar. 10, 1988, abandoned, which is a continuation of Ser. No. 97,347, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 743,191, Jun. 10, 1985, abandoned. This application Jan. 19, 1989, Ser. No. 300,738

Int. Cl.[4] C07D *457/04;* A61K *21/40*

U.S. Cl. 514—210 7 Claims

1. A compound of the formula:



wherein R^a is hydrogen, or a pharmaceutically acceptable salt cation or ester group; wherein R^{16} is hydrogen or methyl; wherein R^7 and R^6 are selected from linear, branched or cyclic C_1–C_5 alkyl, which can be substituted with fluoro, hydroxy, protected hydroxy, sulfoxy, amino, protected amino, wherein R^6 and R^7 taken together can also be C_2–C_4 alkylidene, optionally substituted by the above substituents, with the proviso that both R^6 and R^7 are not unsubstituted alkyl, and R^8 and R^9 are independently chosen from H, or lower alkyl, which can be substituted with OH, alkoxy, NH_2, mono- or dialkylamino, $NR^{11}C(X)R^{11}$, N_3, or $R^{10}SO_2O$, phenyl, benzyl, pyridyl, pyridylmethyl, thienyl, or thienylmethyl, which can be substituted with from 1 to 2 of F, Cl, Br, CF_3, OR^{11}, NR_2^{11}, $OCOR^{11}$, or $NR^{11}C(X)R^{11}$, wherein R^8 and R^9 may also be joined to form a ring of 5 or 6 members containing 0 or 1 oxygen or nitrogen atoms.

4,892,870

OXAZA HETEROCYCLES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

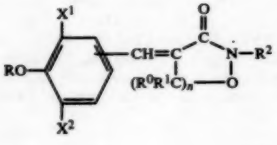
Sung J. Lee, Clarks Summit, Pa., assignor to Biofor, Ltd., Waverley, Pa.

Filed Aug. 1, 1988, Ser. No. 227,572

Int. Cl.[4] C07D *267/04;* A61K *31/55, 31/695;* C07F *7/08*

U.S. Cl. 514—211 44 Claims

1. A compound of the formula:



wherein:

R is a member selected from the group consisting of hydrogen, alkyl, alkanoyl, aroyl, alkoxyalkyl, alkoxycarbonyl, lower alkylaminocarbonyl and di-lower alkylaminocarbonyl;

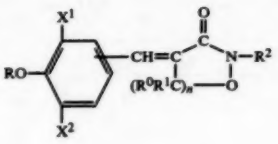
R^0, R^1 and R^2 are the same or different and represent a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower cycloalkyl:

X^1 and X^2 are the same or different and represent a member

selected from the group consisting of teriaryalkyl, trimethylsilyl and trifluoromethyl; and

n is an integer having a value of 1–3; and the nontoxic pharmacologically acceptable salts thereof.

32. A method for treating inflammation in a mammal which comprises administering a safe and effective amount of a compound having the formula:



wherein:

R is a member selected from the group consisting of hydrogen, alkyl, alkanoyl, aroyl, alkoxyalkyl, alkoxycarbonyl, lower alkylaminocarbonyl and di-lower alkylaminocarbonyl;

R^0, R^1 and R^2 are the same or different and represent a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower cycloalkyl;

X^1 and X^2 are the same or different and represent a member selected from the group consisting of tertiaryalkyl, trimethylsilyl and trifluoromethyl; and

n is an integer having a value of 1–3; or a non-toxic pharmacologically acceptable salt thereof.

4,892,871

AZIDO-SUBSTITUTED OCTOPAMINE AGONISTS AND THE USE THEREOF TO CONTROL INVERTEBRATE PESTS

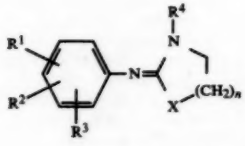
James A. Nathanson, Wellesley, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Filed Apr. 12, 1988, Ser. No. 180,758

Int. Cl.[4] A01N *43/86, 43/50;* **C07D** *233/50*

U.S. Cl. 514—227.2 **14 Claims**

1. An azido-substituted octopamine agonist of the formula:



wherein

R^1 is azido,

R^2 and R^3 are the same or different and selected from the group consisting of hydrogen, azido, hydroxy, fluorine, bromine, chlorine, iodine, nitro, lower (C_1–C_6) alkyl, lower (C_1–C_6) alkoxy, lower haloalkyl, amino, mono-lower alkyl amino, di-lower alkyl amino, hydroxy substituted alkyl amino, lower acyl amino, and R^2 and R^3 may together form a fused ring;

R^4 is hydrogen, lower alkyl or lower alkyl substituted by hydroxy or lower alkoxy;

n=1 or 2;

X is NH, O, CH_2, or S; and

wherein the ratio $K_d^{oct}/K_d^{(Azido)}$ for said azido-substituted octopamine agonist, as determined in a broken cell preparation of the firefly light organ, is greater than 1;

with the proviso that wherein R^2 is fluorine, bromine, chlorine or iodine, then R^3 is selected from the group consisting of hydrogen, nitro, lower (C_1–C_6) alkyl, lower (C_1–C_6) alkoxy, lower haloalkyl, amino, mono-lower alkyl amino, di-lower alkyl amino, hydroxy substituted alkyl amino, and lower acyl amino.

13. A method of controlling an invertebrate pest comprising bringing into contact with said pest an invertebrate pest-controlling amount of the azido-substituted octopamine agonist of claim 1.

4,892,872

BENZOXAZINE COMPOUNDS AND PHARMACEUTICAL USE THEREOF

Tetsuya Tahara; Takeshi Kawakita, both of Oita; Mitsuyoshi Yasumoto, and Takemi Fukuda, both of Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

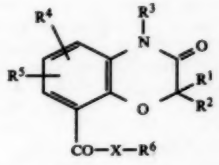
Filed Oct. 24, 1988, Ser. No. 261,067

Claims priority, application Japan, Oct. 22, 1987, 62-267953; Dec. 25, 1987, 62-331259; Jan. 13, 1988, 63-5415

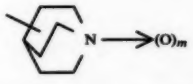
Int. Cl.[4] A61K *31/535;* **C07D** *265/36*

U.S. Cl. 514—230.5 **5 Claims**

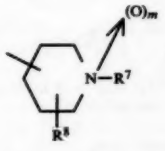
1. A benzoxazine compound of the formula:



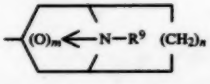
wherein R^1 and R^2 are the same or different, and each represents hydrogen or alkyl: R^3 represents hydrogen, alkyl, phenylalkyl or substituted phenylalkyl; R^4 and R^5 are the same or different, and each represents hydrogen, halogen, alkyl, alkoxy, amino, acylamino, alkylamino, hydroxy or nitro; X represents oxygen or NH; R^6 represents a group of the formula:



wherein m is 0 or 1, a group of the formula;



wherein R^7 represents alkyl, phenylalkyl, phenoxyalkyl, substituted phenylalkyl or substituted phenoxyalkyl, R^8 represents hydrogen or alkoxy and m is as defined above, or a group of the formula:



wherein R^9 represents alkyl, phenylalkyl or substituted phenylalkyl, n is 0 or 1, and m is as defined above, an optical isomer thereof or a pharmaceutically acceptable salt thereof.

4,892,873

N-SUBSTITUTED -N-(3-(1,2,4-TRIAZOLO-(4,3-B)PYRIDAZIN-6-YL)PHENYL)ALKANAMIDES, CARBAMATES AND UREAS

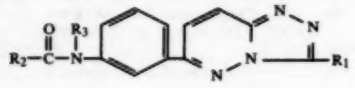
Jay D. Albright, Nanuet, N.Y.; Dennis W. Powell, Greenwich, Conn., and John P. Dusza, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 31,331, Mar. 27, 1987, Pat. No. 4,767,765, which is a division of Ser. No. 793,437, Oct. 21, 1985, Pat. No. 4,654,343. This application Apr. 19, 1988, Ser. No. 183,124

Int. Cl.[4] A61K *31/50*

U.S. Cl. 514—248 **10 Claims**

1. A method of inducing skeletal muscle relaxation in a mammal which comprises administering to said mammal a pharmacologically effective amount of a compound of the formula



wherein R_1 is a hydrogen, alkyl(C_1–C_3), amino, monoalkyl(C_1–C_3)amino, dialkyl(C_1–C_3)-amino, -NHCoalkyl(C_1–C_3) or N-alkyl(C_1–C_3)-CO-alkyl(C_1–C_3); R_2 is hydrogen, alkyl (C_1–C_6), cycloalkyl (C_3–C_6), -O-alkyl(C_1–C_6), -NH-alkyl (C_1–C_3), -N-dialkyl(C_1–C_3), -$(CH_2)_n$-O-alkyl(C_1–C_3), -$(CH_2)_n$-NH-alkyl (C_1–C_3) or -$(CH_2)_n$-N-dialkyl(C_1–C_3), where n is an integer from 1 to 3 inclusive; and R_3 is alkyl(C_1–C_6), —CH_2OCH_3 —$CH_2CH_2OCH_3$.

4,892,874

SYNERGISTIC ANTICANCER COMBINATION

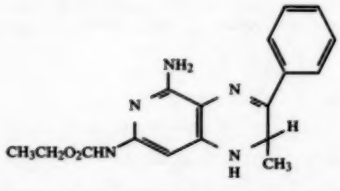
Carroll G. Temple, and Glynn P. Wheeler, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Nov. 4, 1986, Ser. No. 926,559

Int. Cl.[4] A61K *31/50, 31/495, 31/44*

U.S. Cl. 514—249 **9 Claims**

1. A method for the treatment of a mammal afflicted with a tumor comprising administering to said mammal a synergistic combination of an antineoplastically effective amount of a compound having the formula



(I)

or a pharmaceutically acceptable salt thereof and an antineoplastically effective amount of vincristine.

4,892,875

SUBSTITUTED HETEROCYCLYLALKYL ESTERS OF 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACIDS

Kanji Meguro, Nishinomiya, and Akinobu Nagaoka, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

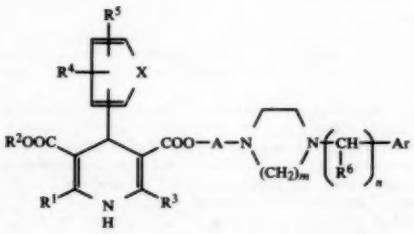
Continuation of Ser. No. 488,663, Apr. 26, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,196

Claims priority, application PCT Int'l Appl., May 10, 1982, PCT/JP/82/00159; Jan. 11, 1983, PCT/JP83/00008

Int. Cl.[4] A61K *31/495*; C07D *401/12*

U.S. Cl. 514—253 **15 Claims**

1. A dihydropyridine compound of the formula



(I)

wherein

R^1, R^2 and R^3 are the same or different and each is C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{3-6}-cycloalkyl-C_{1-6}-alkyl, or C_{3-7}-alkoxyalkyl;

R^4 and R^5 are the same or different and each is hydrogen, halogen, nitro, trifluoromethyl, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{2-4}-alkoxycarbonyl or C_{1-3}-alkylthio; R^6 is hydrogen, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, phenyl-C_{1-3}-alkyl optionally substituted on the phenyl ring by halogen, nitro trifluoromethyl, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{1-3}-alkylthio and C_{2-4}-alkoxycarbonyl groups, or phenyl, or naphthyl, wherein the phenyl or naphthyl groups can be optionally substituted by one or two halogen, nitro, trifluormethyl, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{1-3}-alkylthio and C_{2-4}-alkoxycarbonyl groups; A is C_{2-4}-alkylene;

Ar is 2-pyridyl, 3-pyridyl, 4-pyridyl or phenyl or naphthyl which phenyl or naphthyl can be optionally substituted by one or two nitro, trifluoromethyl, halogen, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{1-3}-alkylthio and C_{2-4}-alkoxycarbonyl groups;

m is an integer of 1 to 3 inclusive;

n is an integer of 1 or 2, and

wherein

represents phenyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-furyl, 2-thienyl, 2,1,3-benzoxadiazol-4-yl, or 2,1,3-benzothiadiazol-4-yl; or a pharmaceutically acceptable salt thereof.

15. A pharmaceutical composition which comprises, as an active ingredient, an effective antihypertensive amount of a dihydropyridine compound or its salt as defined in claim 1, and a pharmaceutically acceptable carrier or diluent therefor.

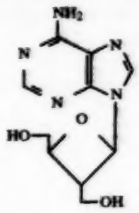
4,892,876

METHOD FOR INHIBITING HIV AND AN PHARMACEUTICAL COMPOSITION THEREFOR

Hiroo Hoshino, Maebashi, and Nobuyoshi Shimada, Tokyo, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,637
Claims priority, application Japan, Apr. 21, 1987, 62-98439
Int. Cl.[4] A61K *31/52*
U.S. Cl. 514—265 2 Claims

1. A method for inhibiting HIV in human cell in vivo which comprises applying oxetanocin represented by the formula (I)



(I)

or a pharmaceutically acceptable salt thereof to the human cell in a therapeutically effective amount.

4,892,877

ANTITUSSIVE LIQUID COMPOSITIONS CONTAINING PHENOL

James V. Sorrentino, Wilton, Conn., assignor to Richardson-Vicks Inc., Shelton, Conn.

Filed Oct. 27, 1987, Ser. No. 112,922
Int. Cl.[4] A61K *31/485*
U.S. Cl. 514—289 7 Claims

1. A liquid pharmaceutical composition of matter for use in the treatment of coughs and associated sore throat, by direct swallowing, comprising, per 5–30 ml dose:

(a) an aqueous-based orally acceptable pharmaceutical carrier;

(b) an effective antitussive amount of dextromethorphan hydrobromide;

(c) from about 10 to about 150 milligrams of phenol; and

(d) from about 5 to about 25 volume/volume percent of co-solvent; said composition having a pH of about 5–9.

4,892,878

OLEIC ACID ESTERS AND PHARMACEUTICAL COMPOSITIONS

Klaus G. Jensen, Frederiksberg, and Peter Bregnedal, Allerod, both of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

Filed Nov. 24, 1987, Ser. No. 124,819
Claims priority, application United Kingdom, Dec. 3, 1986, 8628903
Int. Cl.[4] A61K *31/445*; C07D *211/52*
U.S. Cl. 514—327 4 Claims

1. The oleic acid ester of 4-(4-(4-chlorophenyl)-4-hydroxy-1-piperidinyl)-1-(4-fluorophenyl)-1-butanone, as well as pharmaceutically acceptable acid addition salts thereof.

3. Method for the alleviation of psychic abnormalities in a subject in need thereof comprising the step of parenterally administering to the said subject a neuroleptically-effective amount of a compound of claim 1.

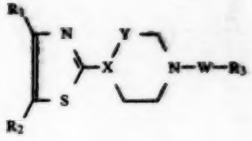
4,892,879

1-SUBSTITUTED-4-(THIAZOLYL-2-)-PIPERAZINES, -PIPERIDINES AND TETRAHYDRO-PYRIDINES USEFUL AS ANXIOLYTIC, PSYCHOGERIATRIC, ANTIDEPRESSANT AND ANTISCHIZOPHRENIC AGENTS

Dieter Sorg, Bern, Switzerland, assignor to Sandoz Pharm. Corp., E. Hanover, N.J.

Division of Ser. No. 876,697, Jun. 20, 1986, Pat. No. 4,737,588. This application Feb. 2, 1988, Ser. No. 151,349
Claims priority, applications Fed. Rep. of Germany, Jun. 22, 1985, 3522354; Jun. 22, 1985, 3522393; Jun. 22, 1985, 3522361; Feb. 24, 1986, 3605868
Int. Cl.[4] A61K *31/415*; C07D *417/14*
U.S. Cl. 514—338 5 Claims

1. A compound of formula I:



I

wherein

R_1 and R_2 independently are hydrogen, (C_{1-4})alkyl, (C_{3-6})cycloalkyl, (C_{3-6})cycloalkyl(C_{1-3})alkyl, phenyl, phenyl(C_{1-3})alkyl or

R_1 and R_2 signify together trimethylene, tetramethylene or pentamethylene, optionally substituted at the same or different carbon atoms by 1 or 2 methyl groups, or

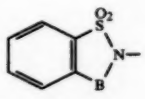
R_1 and R_2 signify together $—(CH_3)_2C—O—C(CH_3)_2—$,

R_1 may additionally signify trifluoromethyl;

W is alkylene of 2 to 6 carbon atoms, or alkenylene or alkynylene of 4 to 6 carbon atoms, whereby the unsaturation is not adjacent to the nitrogen atoms;

X—Y is C═CH or CH—CH_2; and

R_3 is a group of formula (f)



(f)

in which B is

where R_4 is hydrogen or (C_{1-4})alkyl, and R_5 is hydrogen, (C_{1-4})alkyl, phenyl or phenyl(C_{1-4})alkyl; or is C═O; or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition useful in treating anxiety, geriatric disorders, depressions or schizophrenia comprising a pharmaceutically acceptable carrier or diluent and a therapeutically effective amount of a compound of claim 1, or a pharmaceutically acceptable acid addition salt thereof.

4,892,880

PESTICIDAL PYRIDYLTHIADIAZOLES

Odd Kristiansen, Möhlin, and Jozef Drabek, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

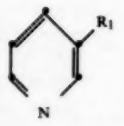
Continuation of Ser. No. 570,711, Jan. 13, 1984, abandoned. This application Jan. 7, 1987, Ser. No. 4,743

Claims priority, application Switzerland, Jan. 19, 1983, 300/83

Int. Cl.[4] C07D *417/04;* A01N *43/40*

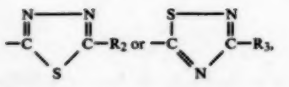
U.S. Cl. 514—342 5 Claims

1. A method of combating insects which attack plants, which method comprises applying to said plants or to the locus thereof an insecticidally effective amount of a compound of the formula I



(I)

wherein R_1 is



R_2 is hydrogen and R_3 is hydrogen or C_1–C_4alkyl.

4,892,881

DIHYDROPYRIDINE ANTI-ISCHAEMIC AND ANTIHYPERTENSIVE AGENTS

David Alker, Margate; Simon F. Campbell, Kingsdown, and Peter E. Cross, Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

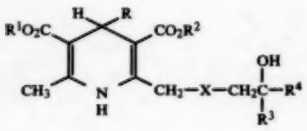
Division of Ser. No. 927,881, Nov. 5, 1986, Pat. No. 4,732,985. This application Nov. 2, 1987, Ser. No. 115,274

Claims priority, application United Kingdom, Nov. 9, 1985, 8527698

Int. Cl.[4] A61K *31/455;* C07D *211/90*

U.S. Cl. 514—356 7 Claims

1. A compound of the formula:



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein

R is selected from the group consisting of 2-chlorophenyl, 2,3-dichlorophenyl and 2-chloro-3-trifluoromethylphenyl;

R^1 and R^2 are each independently C_1–C_4 alkyl; X is O or S; R^3 is H or C_1–C_4 alkyl; and R^4 is selected from the group consisting of 1,2,4-triazol-1-ylmethyl, imidazol-1-ylmethyl, azidomethyl, 2,4,5-trimethylimidazol-1-ylmethyl, 3,4-dihydro-4-oxopyrimidin-2-ylthiomethyl, pyrimidin-2-ylthiomethyl; pyrimidin-2-ylaminomethyl, 3,4-dihydro-4-oxopyrimidin-2-ylaminomethyl, 2-aminopyrimidin-4-yloxymethyl, methoxymethyl, 2-furyl, 2-pyridylmethyl, imidazol-2-yl, hydroxymethyl, aminomethyl, 1,2,4-triazol-4-ylmethyl or 2-hydroxyethyl.

4,892,882

CARBAMOYLOXY-ISOXAZOLE DERIVATIVES, THEIR PREPARATION AND INSECTICIDAL COMPOSITIONS CONTAINING THEM

Kazuo Tomita; Tadashi Murakami, both of Hiromachi; Hideakira Tsuji, Shiga; Keigo Matsumoto, Shiga, and Katsuhiro Fujita, Shiga, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

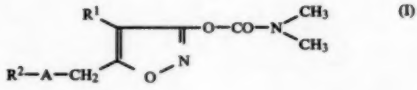
Division of Ser. No. 527,180, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 318,602, Nov. 5, 1981, abandoned. This application Jan. 18, 1985, Ser. No. 692,869

Claims priority, application Japan, Nov. 11, 1980, 55-158550

Int. Cl.[4] A01N *47/18;* C07D *261/12*

U.S. Cl. 514—380 16 Claims

1. An insecticidal composition comprising at least one insecticide and a carrier or diluent, wherein the insecticide is at least one compound of formula (I):



(I)

wherein:

R^1 represents a hydrogen atom or a bromine or chlorine atom;

R^2 represents a C_1–C_3, n-alkyl group; and

A represents a sulphur atom.

4,892,883

PHARMACEUTICAL COMPOSITIONS CONTAINING BILOBALIDE FOR THE TREATMENT OF NEUROPATHIES AI

Shyam S. Chatterjee; Benard L. Gabard, both of Karlsruhe, and Hermann E. W. Jaggy, Bad Schonborn, all of Fed. Rep. of Germany, assignors to Willman - Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

Continuation of Ser. No. 134,577, Dec. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 802,539, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 662,598, Oct. 19, 1984, Pat. No. 4,571,407. This application Oct. 11, 1988, Ser. No. 256,233

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1973, 3338995

Int. Cl.[4] A61K *31/36*

U.S. Cl. 514—464 7 Claims

1. A pharmaceutical composition useful for the treatment of neuropathic disorders which comprises a combination of flavone glycosides and bilobalide in a pharmaceutical carrier wherein the concentration of bilobalide and flavone glycosides are cooperatively sufficient to alleviate neuropathic disorders.

4,892,884

NOVEL HMG-COA REDUCTASE INHIBITORS

Kent W. Neuenschwander, Ambler, and Anthony C. Scotese, King of Prussia, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

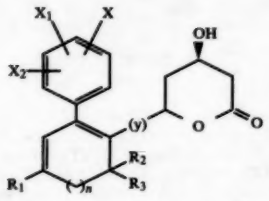
Continuation-in-part of Ser. No. 135,805, Dec. 21, 1987, Pat. No. 4,863,957. This application Dec. 5, 1988, Ser. No. 279,898

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[4] C07D *309/30*

U.S. Cl. 514—460 19 Claims

1. A compound of the formula



and pharmaceutically acceptable salts thereof wherein:

Y is: —CHR—,

—CHRCHR—,

—CHRCHRCHR—, or

—RC=CR—, wherein R is H or lower alkyl;

X, X_1 and X_2 are indepently: H, F, Cl, Br, OH, CF_3 alkyl, or alkoxy;

R_1, R_2 and R_3 are independently: H, alkyl, CF_3, aryl; haloaryl and n=0 or 1 .

4,892,885

ESTERS OF (TRIARYLPHOSPHORANYLIDENE)CARBAMIC ACID FOR EFFECTING DIURESIS

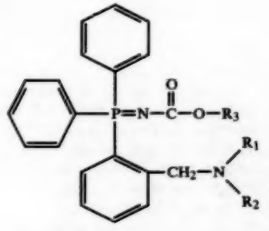
Andrew S. Tomcufcik, Old Tappan; William B. Wright, Jr., Woodcliff Lake, both of N.J., and Walter E. Meyer, Suffern, N.Y., assignors to American Cyanamid Company

Filed Apr. 19, 1988, Ser. No. 183,122

Int. Cl.[4] C07C *125/06*; A61K *31/27*

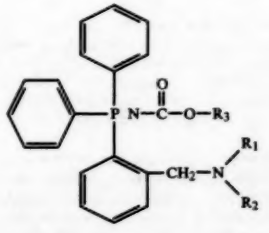
U.S. Cl. 514—478 **9 Claims**

1. A compound of the formula:



wherein R_1 and R_2 may be the same or different and are each individually hyrogen or lower alkyl having from one to four carbon atoms, where lower alkyl may include both straight chain and branched chain alkyl radicals; and R_3 is lower alkyl having from one to four carbon atoms.

8. A method for lowering plasma renin activity in a mammal which comprises administering to the mammal a plasma renin lowering amount of a compound of the formula:



wherein R_1 and R_2 may be the same or different and are each individually hyrogen or lower alkyl having from one to four carbon atoms, where lower alkyl may include both straight chain and branched chain alkyl radicals; and R_3 is lower alkyl having from one to four carbon atoms.

4,892,886

PHENOXYPROPANOLAMINES

Leo Alig, Kaiseraugst, and Marcel Müller, Frenkendorf, both of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 215,195, Jul. 5, 1988, abandoned. This application May 10, 1989, Ser. No. 350,056

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—567 **5 Claims**

1. [p-[2-[[(S)-2-Hydroxy-3-phenoxypropyl]amino]ethyl]-phenoxy]acetic acid or a physiologically compatible salt thereof.

4,892,887

N,N'-BIS(SULFONYL)HYDRAZINES HAVING ANTINEOPLASTIC ACTIVITY

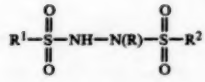
Alan C. Sartorelli, Woodbridge, and Krishnamurthy Shyam, Hamden, both of Conn., assignors to Yale University, New Haven, Conn.

Continuation of Ser. No. 52,493, May 20, 1987, abandoned, which is a division of Ser. No. 810,644, Dec. 18, 1985, Pat. No. 4,684,747, which is a continuation-in-part of Ser. No. 683,852, Dec. 20, 1984, abandoned. This application Aug. 9, 1988, Ser. No. 230,687

Int. Cl.[4] A61K *31/18*

U.S. Cl. 514—601 **14 Claims**

1. A method of inhibiting tumors in host organisms which comprises administering to a said host organism an antineoplastically effective amount of the compound of the formula



where R is selected from the group consisting of methyl and 2-chloroethyl, and $R^1$and R^2, which may be the same or different, are each a C_{1-10} alkyl, phenyl naphthyl moiety, or a ring substituted, phenyl or naphthyl in which the substituent is methyl, ethenyl, methoxy, halo, nitro, or acetylamino.

4,892,888

ANHYDROUS COMPOSITION, STABLE TO OXIDATION, OF ANTHRALIN OR ONE OF ITS DERIVATIVES IN A FATTY ACID ALKYL ESTER AND ITS USE IN THE TREATMENT OF SKIN DISEASES

Jean-Francois Grollier, Paris; Georges Rosenbaum, Asnieres; Josiane Allec, Pierrefitte, and Braham Shroot, Antibes, all of France, assignors to Société Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 435,984, Oct. 22, 1982, abandoned. This application Mar. 31, 1988, Ser. No. 175,602

Claims priority, application France, Oct. 23, 1981, 81 19952; Apr. 5, 1982, 82 05864

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/05*

U.S. Cl. 514—132 **3 Claims**

1. A thickened and stable to oxidation, anhydrous composition for the treatment of diseases of the skin and particularly for psoriasis containing 0.01 to 5% by weight of anthralin in the form of a solution or dispersion of anthralin in a carrier comprising a fatty acid alkyl ester, the fatty acid having from 5 to 18 carbon atoms and the alkyl radical having from 4 to 18 carbon atoms, said fatty acid alkyl ester stabilizing said anthralin, and of 0.1 to 20% by weight of a thickener, said thickener

being a silica having an average particle diameter of less than 30 mμ.

4,892,889

PROCESS FOR MAKING A SPRAY-DRIED, DIRECTLY-COMPRESSIBLE VITAMIN POWDER COMPRISING UNHYDROLYZED GELATIN

Paula S. Kirk, Dearborn Heights, and Dale R. Olson, Riverview, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 932,164, Nov. 18, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 104,446

Int. Cl.[4] A61K *47/00, 31/07, 31/355, 31/59, 31/015*

U.S. Cl. 514—774 **11 Claims**

1. A process for making a spray-dried vitamin powder suitable for the preparation of direct-compression vitamin tablets, comprising:

(A) combining:

(1) a fat-soluble vitamin; and

(2) a gelatin having a bloom number between 30 and 300; and

(3) a water-soluble carbohydrate; and

(4) an effective amount of water to permit spray-drying; so that a mixture is formed;

(B) spray-drying the mixture in a conventional spray-dryer whereby a directly-compressible powder is formed, the relative amounts of vitamin, gelatin, and carbohydrate in the mixture being selected so that the resulting spray-dried powder comprises:

(1) 20 to 60 percent by weight of the fat-soluble vitamin; and

(2) 6 to 46 percent by weight of the gelatin; and

(3) an effective amount of the carbohydrate to prevent extrusion.

4,892,890

EXTERNAL ANALGESIC COMPOSITIONS

Nalinkant C. Damani, Cincinnati, Ohio, assignor to G. D. Searle and Company, Chicago, Ill.

Continuation-in-part of Ser. No. 667,036, Nov. 1, 1984, abandoned. This application May 5, 1986, Ser. No. 859,594

Int. Cl.[4] A61K *9/00, 9/06*

U.S. Cl. 514—784 **5 Claims**

1. An external analgesic solid stick composition comprising about 10 to 30% by weight of methyl salicylate and about 3 to 16% by weight of menthol incorporated within a non reactive hydrophobic wax matrix comprising

(a) about 5 to 25% by weight of stearic acid, about 5 to 25% by weight of stearyl alcohol, together being about 10 to 30% by weight;

(b) about 10 to 40% by weight of paraffins, esters of long-chain fatty acids having from 10 to 30 carbon atoms, or esters of long-chain fatty alcohols having from 10 to 30 carbon atoms;

(c) about 1 to 25% by weight of polyethylene glycol (PEG) esters;

(d) about 1 to 20% by weight of non-hydroxylic volatile silicones; and

(e) about 3 to 25% by weight of propylene glycol

wherein said composition excludes water and reactive lower alcohols.

4,892,891

NOVEL FOAM COMPOSITIONS

Donald S. Close, Stow, Ohio, assignor to Syn-Coat Enterprises, stow, Ohio

Filed Dec. 2, 1988, Ser. No. 279,408

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—69 **21 Claims**

1. A product obtained by the process comprising reacting polymerizable components which include a polyurethane prepolymer in the presence of a blowing agent, and at least one modifying agent, said modifying agent including portland cement, asphalt, epichlorohydrin, a silicone, or mixtures of at least two of the preceding.

4,892,892

FLAME RETARDANT POLYURETHANE FOAM COMPOSITIONS CONTAINING POLYNUCLEARBROMINATED ALKYLBENZENE

Nicolai A. Favstritsky, Lafayette; Richard S. Rose; Dennis M. Borden, both of West Lafayette, and David J. Honkomp, Lafayette, all of Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Oct. 9, 1987, Ser. No. 107,627

Int. Cl.[4] C08J *9/00*

U.S. Cl. 521—107 **9 Claims**

1. A flame retardant polyurethane foam composition comprising:

a polyurethane foam; and

as a flame retardant agent, an effective amount of a liquid polynuclearbrominated higher C_{6-18} alkylbenzene containing about 30–70 percent bromine by weight of the agent, with or without a polyaryl phosphate.

4,892,893

FLAME RETARDANT POLYURETHANE FOAMS RESISTANT TO CIGARETTE SMOLDERING IGNITION

Oscar M. Grace, Troy; Theodore M. Smiecinski, Woodhaven, and Steven E. Wujcik, Romulus, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Feb. 17, 1989, Ser. No. 312,990

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—128 **20 Claims**

1. A flame retardant flexible polyurethane foam which retains its cigarette smoldering resistance after service, comprising the reaction product of (a) a polyoxyalkylene polyether polyol, (b) toluenediisocyanate, (c) a blowing agent, (d) a catalyst, (e) a surfactant, (f) substantially uncrushed melamine, and (g) optionally a flame retardant other than melamine, wherein the concentration of melamine is from about 5 weight percent to about 25 weight percent of the weight of the foam, wherein the density of the foam is from at least 1.2 lbs/ft^3 to about 4 lbs/ft^3, and wherein the melamine has a mean particle size of about 40 μm or more.

4,892,894

PHOTOCOPOLYMERIZABLE COMPOSITIONS BASED ON EPOXY AND HYDROXYL-CONTAINING ORGANIC MATERIALS

Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Chemical and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 794,980, Nov. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 369,835, Apr. 19, 1982, abandoned. This application May 5, 1988, Ser. No. 191,749

Int. Cl.[4] C08G *59/62*

U.S. Cl. 522—31 **1 Claim**

1. A photocopolymerizable composition comprising 3,4-epoxy-cyclohexylmethyl-3,4-epoxycyclohexane carboxylate, a triarylsulfonium salt photoinitiator and a propylene oxide glycerol polyol having a molecular weight of about 2,500 to 4,200, said polyol being present in said composition in an amount of about 10 to about 60 weight percent of the photopolymerizable constituents.

4,892,895

ULTRAVIOLET-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Masatoshi Arai; Shinichi Satoh, and Kazutoshi Fujioka, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,166

Claims priority, application Japan, Jan. 30, 1987, 62-19711

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.[4] C08F 2/46

U.S. Cl. 522—99 14 Claims

1. An ultraviolet-curable organopolysiloxane composition which comprises, in admixture:

(A) its first organopolysiloxane having, in a molecule, at least one organosilyl-substituted alkyl group represented by the general formula

$$-(-CH_2-)_a-Si(O-CMe=CH_2)_b(OR)_c(Me)_d$$

in which Me is a methyl group, R is a monovalent hydrocarbon group free from aliphatic unsaturation, a is 2 or 3, b is 1, 2 or 3 and c and d are each 0, 1 or 2 with the proviso that b+c+d=3;

(B) a second organopolysiloxane having, in a molecule, at least two mercaptoalkyl groups bonded to the silicon atoms in an amount sufficient to provide from 0.1 to 20 moles of mercaptoalkyl groups per mole of the isopropenyloxy groups in the component (A);

(C) an organosilicon compound having at least one vinyl group bonded to the silicon atom in its molecule, in an amount sufficient to provide from 0.01 to 10 moles of vinyl groups per mole of the isopropenyloxy groups in the component (A); and

(D) a photosensitizer in an amount effective to promote the ultraviolet-induced reaction of the components (A), (B) and (C).

4,892,896

PROCESSING POLYIMIDE PRECURSOR COMPOSITIONS

William E. Wright, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 4, 1988, Ser. No. 179,398

Int. Cl.[4] C08J 3/28

U.S. Cl. 523—300 20 Claims

1. A flowable liquid polyimide precursor composition having a solids content of at least 70% by weight and comprising (a) 25–40 wt % of a diester of an aromatic tetracarboxylic acid (b) 25–50 wt % of 2,2-bis[4-(4-aminophenoxy)-phenyl]hexafluoropropane or 2,2-bis[4-(3-aminophenoxy)phenyl]-hexafluoropropane, (c) 2–20 wt % of a polyamic acid having a weight average molecular weight of about 1500 to about 5000 produced from (a) and (b), and (d) 15–25 wt % of an inert solvent produced by the process comprising:

(1) forming a composition that is viscous liquid at 60° to 80° C. and a non-flowable semi-solid or viscous liquid when cooled by

(i) combining substantially equimolar quantities of component (a) and component (b) in component (d);

(ii) heating the combination of step i) to about 70° to 95° for a time sufficient to react some of component (a) with some of component (b) to form component (c);

(iii) cooling the composition from step (ii) thereby forming said non-flowable semi-solid or liquid polyimide precursor.

(2) Subjecting the polyimide precursor composition of step 1) to microwave radiation of intensity and for a time sufficient to form said flowable liquid polyimide precursor composition but not cause a significant change in the chemical composition of said non-flowable semi-solid or liquid precursor composition.

4,892,897

COATING COMPOSITIONS

Richard P. Redman, Reading, England, assignor to Imperial Chemical Industries PLC, London, England

Filed May 12, 1988, Ser. No. 193,096

Claims priority, application United Kingdom, May 28, 1987, 8712577

Int. Cl.[4] C08K 3/20; C08L 63/00

U.S. Cl. 523—404 15 Claims

1. A coating composition comprising:

(i) a non-gelled amine-expoxide reaction product having units derived from:

(a) at least one secondary amine of formula (1):

$$R^1R^2NH \quad (1)$$

where R^1 and R^2 are the same or different and are amino- or protected amino-C_{2-6}alkyl, optionally substituted C_{1-18}alkyl or C_{5-8}Cycloalkyl or R^1 and R^2 together with the nitrogen atom to which they are attached represent an optionally substituted five, six or seven membered heterocyclic group where, in each case, the optional substituent is one or more C_{1-4}alkyl groups, C_{1-4}alkoxy groups or hydroxy groups;

(b) optionally a primary amine of formula (2):

$$R^3NH_2 \quad (2)$$

where R^3 is C_{1-18}alkyl or C_{5-8}cycloalkyl optionally substituted with amino, di-C_{1-4}alkylamino, morpholino or piperazino;

(c) units derived from a polyepoxide;

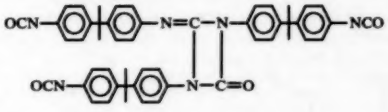
(d) optionally capping units for the polyepoxide;

(e) optionally units derived from a polyoxyalkylene polyamine; and

(f) optionally capping units for the primary amine or for the polyoxyalkylene polyamine, said capping units being derived from a monoepoxide;

(ii) a crosslinker for the amine-epoxide reaction product, the crosslinker being a mixed reaction product derived from a diol and/or a triol; a mixture of 4,4'-diphenylmethane diisocyanate and 4,4'-diphenyl methane diisocyanate uretonimine derivative having the formula (3):

(3)



the compound of formula (3) being present in an amount such that the mixture of 4,4'-diphenylmethane diisocyanate and the uretonimine derivative is liquid at room temperature and a mono alcohol or caprolactam; and

(iii) an aqueous carrier for the composition.

4,892,898

WATER SOLUBLE POLYMERS CONTAINING ALLYLOXYBENZENESULFONATE MONOMERS

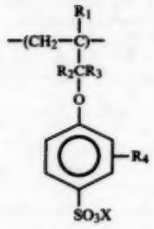
John C. Leighton, Flanders, and Michael J. Sanders, Flemington, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 944,478, Dec. 19, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,125

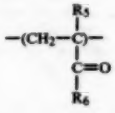
Int. Cl.[4] C08K 3/18; C08F 228/02

U.S. Cl. 524—3 7 Claims

1. A water soluble polymer consisting essentially of 1 to 20 mole percent of a recurring monomer unit (A) represented by the chemical structure:



wherein R_1, R_2, R_3, and R_4 are independently hydrogen or C_1–C_6 alkyl; and X is hydrogen, an alkali or alkaline earth metal or ammonium, and 80 to 99 mole percent of a monomer unit (B) represented by the structure



wherein R_5 is hydrogen or C_1–C_6 alkyl;

R_6 is OX' or NR_7R_8;

R_7 and R_8 are independently hydrogen, C_1–C_6 alkyl, or an alkyloxyether or alcohol; and

X' is hydrogen, C_1–C_6 alkyl, hydroxyalkyl, an alkali or alkaline earth metal or ammonium.

4,892,899

NOVEL COMPOSITIONS BASED ON TETRACHLOROISOINDOLINONE PIGMENTS

Edward E. Jaffe, Wilmington, Del.; Jost von der Crone, Arconciel, and Bernhard Medinger, Giffers, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

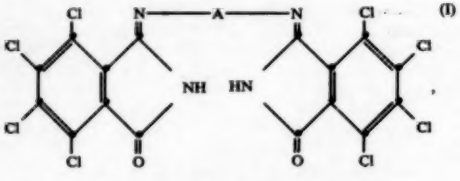
Filed Dec. 8, 1987, Ser. No. 130,245

Int. Cl.[4] C08K *5/34;* **C07D** *209/50*

U.S. Cl. 524—83 **29 Claims**

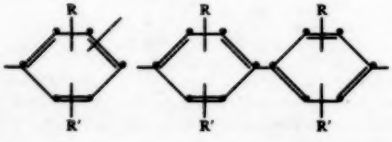
1. A composition containing

(a) an isoindolinone pigment of the formula I



(I)

in which A is one of the groups of the formulae



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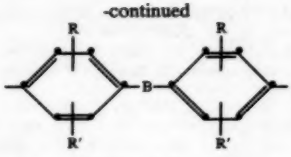
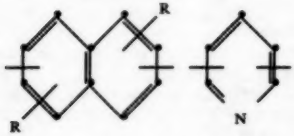
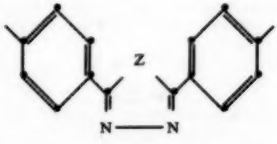
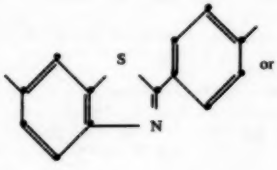
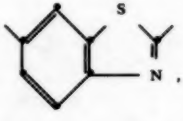


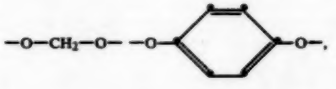






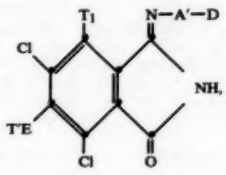


in which B is —O—, —S—, —SO_2—, —N=N—, —CH_2—, —CH=CH—,



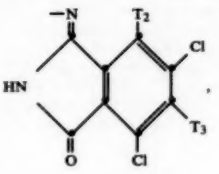
—CONH—, —NHCONH—, or —CONHNHCO—, Q is —O— or —NH— and Z is —O— or —S— and R and R' are independently of each other hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or phenoxy, and

(b) a compound of the formula II



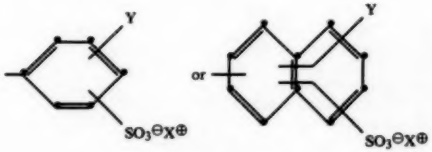
(II)

in which A' is as defined above for A, D is hydrogen, amino or a group of the formula III



(III)

E is —O— or —S—, T_1, T_2 and T_3 independently of one another are chlorine or a group —ET', T' is a group of the formulae



$X^{\oplus}$ is $H^{\oplus}$ or a group of the formulae $M^{n\oplus}/n$ or $N^{\oplus}(R_1)(R_2)(R_3)(R_4)$, $M^{n\oplus}$ is an n-valent metal cation, n is 1, 2 or 3, R_1, R_2, R_3 and R_4 are independently of one another hydrogen, C_1–C_{18}-alkyl, C_5–C_6-cycloalkyl, unsubstituted or C_1–C_{18}-alkyl-substituted phenyl or R_3 and R_4 together with the N atom form a pyrrolidine, imidazolidine, piperidine, piperazine or morpholine radical, or R_2, R_3 and R_4 together with the N atom form a pyrrole, pyridine, picoline, pyrazine, quinoline or isoquinoline radical and Y is hydrogen, halogen, methyl, methoxy or amino.

29. A cellulose ether, cellulose ester, natural resin or synthetic resin containing a composition according to claim 1.

4,892,900

POLYPHENYLENE ETHER RESIN COMPOSITION

Isao Sasaki; Naoki Yamamoto, both of Hiroshima, and Akira Yanagase, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,734

Int. Cl.[4] C08L *51/08;* **C08K** *7/14, 5/52, 3/22*

U.S. Cl. 524—141 **15 Claims**

1. A polyphenylene ether resin composition comprising a polyphenylene ether resin (A), a polystyrene resin (B), and a polyorganosiloxane-based graft copolymer (C) produced by graft polymerizing one or more vinyl monomers onto a polyorganosiloxane rubber which contains a graft-linking agent copolymerized and exhibits a degree of swelling of 3 to 15 measured in toluene.

4,892,901

POLYETHERIMIDE ESTER ELASTOMER

Nan-I Liu, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 31, 1987, Ser. No. 139,912

Int. Cl.[4] C08L *63/06*

U.S. Cl. 524—303 **25 Claims**

1. A polyetherimide ester composition comprising:
(i) as least one polyetherimid ester resin; and
(ii) a modifier composition which is comprised of 0.1 to 2.0 weight percent of triglycidyl isocyanurate.

4,892,902

METHOD FOR PRODUCTION OF AQUEOUS DISPERSION OF INORGANIC PIGMENT

Shobu Shioji, Himeji; Masazumi Sasabe, Kakogawa; Yorimichi Dairoku, Himeji, and Teruaki Fujiwara, Nagaokakyo, all of Japan, assignors to Nippon Shokubai Kagaku, Co., Ltd., Osaka, Japan

Division of Ser. No. 118,311, Nov. 6, 1987, Pat. No. 4,818,783. This application Mar. 27, 1989, Ser. No. 328,687

Claims priority, application Japan, Nov. 7, 1986, 61-263843; Nov. 14, 1986, 61-269775; Nov. 17, 1986, 61-271964; Nov. 21, 1986, 61-276451; Nov. 21, 1986, 61-276452; Apr. 13, 1987, 62-88704

Int. Cl.[4] C08K *3/32;* **C08L** *29/04*

U.S. Cl. 524—417 **10 Claims**

1. A method for the production of an aqueous dispersion by the dispersion of an inorganic pigment in an aqueous medium, which method comprises incorporating in said inorganic pigment as a dispersant (I) 0.1 to 2 parts by weight of a water-soluble condensed phosphate and (II) 0.03 to 1 part by weight of a water-soluble anionic modified polyvinyl alcohol possessing a polymerization degree in the range of 30 to 700 , a saponification degree in the range of 30 to 100 mol%, and an anionic modification degree in the range of 0.5 to 20 mol%, respectively based on 100 parts by weight of said inorganic pigment.

4,892,903

ELASTOMERIC FIBERS, STRUCTURES FASHIONED THEREFROM AND ELASTOMERIC FILMS

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 882,986, Jul. 7, 1986, abandoned. This application Aug. 20, 1987, Ser. No. 87,477

Int. Cl.[4] C08L *25/04, 25/16, 53/02, 91/08*

U.S. Cl. 524—488 **47 Claims**

1. An elastomeric fiber comprising at least one block copolymer comprising at least two polymeric blocks containing predominantly monoalkenyl aromatic hydrocarbon monomer units having a weight-average molecular weight within the range from about 4,000 to about 50,000 and at least one polymeric block containing predominantly conjugated diolefin monomer units which have been hydrogenated so as to saturate at least about 80% of the ethylenic unsaturation in the polymer block after its preparation and having a weight-average molecular weight within the range from about 10,000 to about 200,000, from about 5 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a polymer selected from the Group consisting of homopolymers of anionic polystyrene, homopolymers of α-methylstyrene, hydrogenated polystyrene, and copolymers of α-methylstyrene and styrene, said polymer selected from said group having a weight-average molecular weight within the range from about 1,000 to about 17,000 and from about 0 parts to about 50 parts, by weight, per 100 parts, by weight, of combined block copolymer of a parraffinic and/or microcrystalline wax.

15. A nonwoven structure prepared with an elastomeric fiber comprising at least one block copolymer comprising at least two polymeric blocks containing predominantly monoalkenyl aromatic hydrocarbon monomer units having a weight-average molecular weight within the range from about

4,000 to about 50,000 and at least one polymeric block containing predominantly conjugated diolefin monomer units which have been hydrogenated so as to saturate at least about 80% of the ethylenic unsaturation in the polymer block after its preparation and having a weight-average molecular weight within the range from about 10,000 to about 200,000, from about 5 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a polymer selected from the Group consisting of anionic polystyrene, homopolymers of α-methylstyrene, hydrogenated polystyrene, and copolymers of α-methylstyrene and styrene, said polymer selected from said group having a weight-average molecular weight within the range from about 1,000 to about 17,000 and from about 0 parts to about 50 parts, by weight, per 100 parts, by weight, of combined block copolymer of a paraffinic and/or microcrystalline wax.

29. An elastomeric film comprising at least one block copolymer comprising at least two polymeric blocks containing predominantly monoalkenyl aromatic hydrocarbon monomer units having a weight-average molecular weight within the range from about 4,000 to about 50,000 and at least one polymeric block containing predominantly conjugated diolefin monomer units which have been hydrogenated so as to saturate at least about 80% of the ethylenic unsaturation in the polymer block after its preparation and having a weight-average molecular weight within the range from about 10,000 to about 200,000, from about 5 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a polymer selected from the Group consisting of homopolymers of anionic styrene, homopolymers of α-methylstyrene, hydrogenated polystyrene, and copolymers of α-methylstyrene and styrene, said polymer selected from said group having a weight-average molecular weight within the range from about 1,000 to about 17,000 and from about 0 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a paraffinic and/or microcrystalline wax.

4,892,904

GLASS-REINFORCED BLENDS OF POLYPHENYLENE ETHER RESIN AND POLYOLEFIN HAVING IMPROVED HEAT DISTORTION TEMPERATURE

Sai-Pei Ting, Delmar, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 658,476, Oct. 9, 1984, abandoned. This application Jun. 27, 1988, Ser. No. 211,697

Int. Cl.[4] C08K *3/40;* **C08L** *71/04*

U.S. Cl. 524—494 **25 Claims**

1. A thermoplastic composition comprising a homogeneous admixture of

(a) a polyphenylene ether resin;

(b) a homopolymeric alkenyl aromatic resin, with or without a rubber modifier;

(c) from at least 15 to about 95 parts by weight, based upon 100 parts by weight of (a), (b), (c) and (d) of a polyolefin resin;

(d) an alkenyl aromatic-based copolymer or terpolymer in an amount sufficient to improved the compatibility between components (a) and (c); and

(e) an amount of fibrous glass effective to increase the flexural modulus and the heat distortion temperature of the composition after molding.

4,892,905

ADHESIVE EMULSION

Andre Lepert, Allouville Bellefosse, France; Morris L. Evans, Baton Rouge, La., and Lutz E. Jacob, Wezembeek-Oppem, Belgium, assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 899,185, Aug. 18, 1986, Pat. No. 4,766,169, which is a division of Ser. No. 717,980, Mar. 28, 1985, Pat. No. 4,633,698. This application Feb. 26, 1988, Ser. No. 160,980

Claims priority, application United Kingdom, Mar. 28, 1984, 84-07984

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.[4] C08J *3/04;* **C08L** *33/02, 57/00*

U.S. Cl. 524—499 **5 Claims**

1. An adhesive emulsion comprising a homogenous mixture of 100 parts by weight carboxylated styrene butadiene polymer and an aqueous emulsion containing about 20 to 150 parts by weight of a resin having a softening point from 10° C. to 80° C., said resin comprising a Friedel-Crafts catalyzed polymerization copolymer of a feed comprising predominantly petroleum cracked distillate C_5 olefins and diolefins and one or more monovinyl aromatic compounds, said resin containing from 10 to 30 wt. % of the monovinyl aromatic compounds.

4,892,906

URETHANE COATING COMPOSITION

Phung N. Pham, Shorewood, and William E. Michael, Muskego, both of Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 28, 1988, Ser. No. 250,275

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—730 **14 Claims**

1. A thermosetting coating composition comprising:

(a) an acrylic polyol;

(b) a polyester polyol;

(c) a blend of curing agents; and

(d) a liquid carrier.

4,892,907

FAST ROOM TEMPERATURE VULCANIZING SILICONE ELASTOMERS

Warren R. Lampe, Charlton, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Dec. 8, 1988, Ser. No. 282,228

Int. Cl.[4] C08K *5/24*

U.S. Cl. 524—731 **14 Claims**

1. An organopolysiloxane composition of matter, comprising (i) a polyhydroxylated polysiloxane, (ii) a polyacyloxysilane cross-linking agent therefor, and (iii) a hardening accelerator which comprises a water-in-oil emulsion of water in a polysiloxane stabilized with an organosilicon surface active agent.

4,892,908

RUBBER COMPOSITION AND METHOD FOR MAKING THE SAME

Bojayan Durairaj; Alex P. Peterson, Jr., and Gideon Salee, all of Pittsburgh, Pa., assignors to Indspec Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,395

Int. Cl.[4] C08L *61/00*

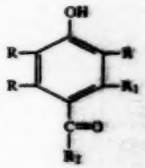
U.S. Cl. 525—160 **7 Claims**

1. A vulcanizable rubber composition comprising

(a) rubber component selected from at least one member of the group consisting of natural rubber, styrene butadiene copolymer rubber, polyisoprene rubber, polybutadiene rubber, acrylonitrile butadiene rubber and polychloroprene rubber,

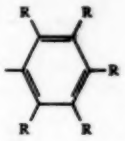
(b) a methylene donor compound which is capable of generating formaldehyde by heating, and

(c) a methylene acceptor selected from at least one compound of the general structural formula



Wherein R may be the same or different radicals selected from the group consisting of hydrogen, alkyl of 1 to about 20 carbon atoms, aryl of about 6 to about 12 carbon atoms, R_1 is —H, —OH, —O—CO—R_3 or —O—R_4 and R_3 and R_4 are each an alkyl or aryl group having 1 to about 12 carbon atoms.

Wherein R_2 is a hydrocarbon radical, saturated or unsaturated of 1 to about 20 carbon atoms, naphthyl or an aromatic radical of the formula



wherein R may be the same or different and is defined as above.

4,892,909

COMPATIBLE STYRENE-METHACRYLATE POLYMER BLENDS

Werner Siol, Darmstadt-Eberstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 233,754

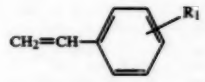
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730026

Int. Cl.[4] C08L *25/04, 25/06, 33/10*

U.S. Cl. 525—216 **11 Claims**

1. A compatible polymer blend consisting of:

(I) 0.1–99.9% by weight of a polymerisate Pl, which is formed from monomers of formula I:



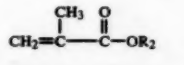
I

wherein R_1 is hydrogen or methyl, and

(II) 99.9–0.1% by weight of copolymerisate P2, which is formed from

(a) 5–40% by weight of cyclohexyl methacrylate

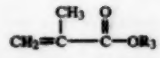
(b) 30–70% by weight of a methacrylic ester of formula II:



II

wherein R_2 is methyl or ethyl,

(c) 10–50% by weight of a methacrylic ester of formula III:



III

wherein R_3 is a hydrocarbon group having 4–18 carbon atoms, and

(d) 0–10 parts by weight of a monomer M which is copolymerizable with monomers of (a)–(c), yet different from these monomers.

4,892,910

POLYMER POWDERS OF LOW FINES CONTENT AND METHOD FOR MAKING THE SAME BY SPRAY DRYING

Wolfgang Klause, Mainz; Hubert Rauch, Weiterstadt; Peter J. Arndt, Seeheim-Jugenheim, and Norbert Suetterlin, Muehltal-Nieder-Beerbach, all of Fed. Rep. of Germany, assignors to GmbH Röhm, Darmstadt, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,808

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723668

Int. Cl.[4] B01D *1/18*; C08L *33/00*

U.S. Cl. 525—221 **7 Claims**

1. Powder grains consisting essentially of aggregated particles of two different polymers (A) and (B), wherein (1) 70 to 99.5 percent by weight of said powder grains comprise particles of polymer (A) having a dynamic glass transition temperature which is above 90° C., said particles of polymer (A) not being sintered together, and (2) 30 to 0.5 percent by weight of said powder grains comprise particles of polymer (B) having a dynamic glass transition temperature from 55° C. to 90° C. and which is at least 10 Centigrade degrees less than the dynamic glass transition temperature of polymer (A), said particles of polymer (B) being sintered to one another and to particles of polymer (A).

4,892,911

FILMS USING BLENDS OF POLYPROPYLENE AND POLYISOBUTYLENE

Roger P. Genske, Neenah, Wis., assignor to American National Can Company, Chicago, Ill.

Continuation of Ser. No. 803,029, Nov. 29, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,652

Int. Cl.[4] B29C *47/06*; B32B *27/08, 31/30*; C08L *23/02*

U.S. Cl. 525—240 **35 Claims**

1. A polymeric film comprising a blend of greater than 65% and up to 90% by weight polypropylene polymer, including polypropylene copolymer, and conversely 10% up to less than 35% by weight polyisobutylene, said polypropylene polymer comprising 70 to 98 sole percent propylene moieties and conversely 30 to 2 mole percent ethylene moieties, said film having been made by a process of:

(a) compounding a masterbatch composition by (i) melting polyisobutylene and a polypropylene polymer or copolymer, to form a melt mixture, and (ii) heating and mixing said melt mixture, to thereby form said masterbatch composition;

(b) making a blend of said masterbatch composition and propylene ethylene copolymer containing no more than 30% mol ethylene, whereby the overall composition of said blend is greater than 65% by weight and no more than 90% by weight polypropylene polymer, and con-

versely at least 10% by weight and less than 35% by weight polyisobutylene; and

(c) feeding said blend into an extruder, processing said blend as a melt in said extruder, and extruding said melted blend through a film forming die to form said film.

4,892,912

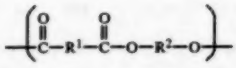
PROCESS FOR PRODUCING AROMATIC POLYESTER

Hideo Hayashi; Hideya Murai, and Nobuyuki Inaba, all of Sodegaura, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,695
Int. Cl.[4] C08F 20/00
U.S. Cl. 525—437 5 Claims

1. A process for producing aromatic polyester which comprises mixing

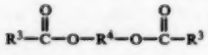
5 to 70 mol % (as calculated by converting the repeating unit mentioned below into one molecule) of polyester (A) with the repeating unit represented by general formula (I),



(I)

and 95 to 30 mol % of an acyloxyl aromatic carboxylic acid (B),

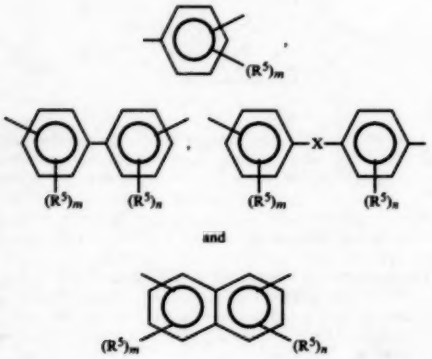
with 0.1 to 20 mol % based on the total amount of (A) and (B), of a diacyloxy aromatic compound (C) represented by general formula (II),



(II)

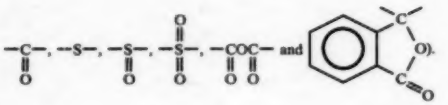
and reacting the resulting mixture;

wherein R^1 represents an aromatic bivalent radical with 6 to 20 carbon atoms, R^2 is selected from the group of an aliphatic bivalent radical with 2 to 20 carbon atoms, an alicyclic bivalent radical with 4 to 20 carbon atoms, an aromatic bivalent radical with 6 to 20 carbon atoms and poly(alkylene oxide) bivalent radical with a molecular weight of 200 to 8000, R^3 represents an alkyl radical with 1 to 8 carbon atoms, and R^4 is selected from the group of



and

(wherein R^5 is selected from the group of a hydrogen atom, a halogen atom, an alkyl radical with 1 to 4 carbon atoms and an alkoxy radical with 1 to 4 carbon atoms, m and n are independently an integer of 1 to 4, and X is selected from the group of —(CH$_2$)—, —(CH$_2$)$_2$—, —CH(CH$_3$)—, —CH(C$_2$H$_5$)—, —CH(CH$_3$)$_2$—, —CH(C$_2$H$_5$)$_2$—, —O—,



4,892,913

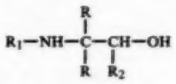
NOVEL CROSSLINKING COMPONENTS CONTAINING BIURET GROUPS FOR CATIONIC PAINT BINDERS

Willibald Paar, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Aug. 25, 1988, Ser. No. 236,201
Claims priority, application Austria, Aug. 25, 1987, 2116/87
Int. Cl.[4] C08G 18/80
U.S. Cl. 525—452 5 Claims

1. Process for preparing crosslinking components containing biuret groups for use with cationic paint binders containing hydroxyl groups and/or primary or secondary amino groups, comprising reacting —

(A1) beta-hydroxyalkylamines having the formula —



(I)

wherein —

R is a hydrogen atom or an alkyl or hydroxymethyl group,

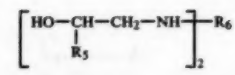
R_1 is an alkyl, hydroxyalkyl, hydroxypoly(alkoxy) group or a group of formula —CH$_2$—CH(R$_4$)—CO—R$_3$,

R_2 is a hydrogen atom, an alkyl group or the residue of a monoepoxide compound after the epoxide group has been reacted with a primary amino group,

R_3 is an alkoxy, hydroxyalkoxy, hydroxypoly(alkoxy) group or -NH$_2$, and

R_4 is a hydrogen atom or a methyl group; or

(A2) beta-hydroxyalkylamines having the formulae —



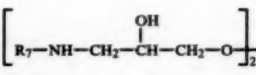
(II)

wherein —

R_5 is a hydrogen atom, an alkyl group, a hydroxy alkyl group, a hydroxy poly(alkoxy) group, a group of the formula —CH$_2$—CH(R$_4$)—CO—R$_3$, or the residue of monoepoxide compound after the epoxide group has been reacted with a primary amino group,

R_6 represents an alkylene or poly(alkoxy) group,

or —



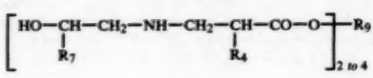
(III)

wherein —

R_7 represents an alkyl group, a hydroxyalkyl or tert-.aminoalkyl group,

R_8 represents an aliphatic and/or aromatic group of a diglycidylether,

or —



(IV)

wherein —

R_9 represents the residue of a polyol with 2 to 4 hydroxyl groups,

with,

(B) isocyanate compounds at 30 to 60° C in a ratio wherein at least one secondary amino group of a beta-hydroxyalkylamine is reacted with an isocyanate group, with the proviso that essentially polyisocyanate compounds are used for the beta-hydroxyalkylamines of group (A1), and essentially monoisocyanate compounds are used for the beta-hydroxyalkylamines of group (A2); and, thereafter, reacting

(C) the NH-groups and any other isocyanate-reactive groups of the reaction product which may be present with 50 to 100 mole- % of a semi-blocked diisocyanate at 20 to 100° C.

4,892,914

CATALYSTS PREPARED FROM TETRAKIS(DIALKYLAMIDE OR DIARYLAMIDE) DERIVATIVES OF TITANIUM AND POLYMERIZATION OF OLEFINS THEREWITH

John G. Hefner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 236,691, Aug. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 126,331, Nov. 30, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 295,855

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—114 **38 Claims**

1. A process for polymerizing one or more α-olefins or a mixture of one of more α-olefins and one or more polymerizable ethylenically unsaturated monomers which process comprises conducting the polymerization under solution conditions in the presence of

(I) a supported catalyst which comprises the product resulting from mixing in a suitable inert diluent

(A) at least one inorganic support;

(B) at least one metal-containing reducing agent; and

(C) as a transition metal component, at least one transition metal compound comprising a titanium tetrakis(dialkylamide) or titanium tetrakis(diarylamide) or a combination thereof;

wherein in the preparation of the catalyst, all of components (A) and (B) are added prior to the addition of component (C); and

(II) a cocatalyst or activator compound; wherein the components are employed in quantities which provide an atomic ratio of Ms:Tm of from about 2:1 to about 160:1; an atomic ratio of Mc:Tm of from about 1:1 to about 64:1; an atomic ratio of Mr:Tm of from about 1:1 to about 64:1; and wherein Ms represents the metal atoms in the support material, Mc represents the metal atoms in the cocatalyst or activator compound, Mr represents the metal atoms in the reducing agent and Tm represents the sum of the transition metal atoms in the transition metal component.

6. A process of claim 1, 2 or 3 wherein the transition metal component, (C), additionally contains at least one zirconium or hafnium compound selected from a zirconium tetrakis(dialkylamide), a zirconium tetrakis(diarylamide), a hafnium tetrakis(dialkylamide), a hafnium tetrakis(diarylamide), or any combination thereof; wherein the atomic ratio of (Zr+Hf) to (Ti+Zr+Hf) is from about >0:1 to about 0.9:1.

4,892,915

COPOLYMERS OF 2-(2-HYDROXY-5-ACRYLOYLOXYALKYL)PHENYL-2H-BENZOTRIAZOLES

Mario Slongo, Tafers, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 886,934, Jul. 18, 1986, Pat. No. 4,785,063. This application Jul. 13, 1988, Ser. No. 218,188

Claims priority, application Switzerland, Jul. 26, 1983, 4087/83

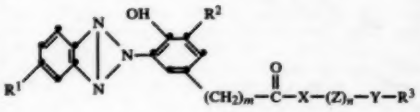
Int. Cl.[4] C07D *249/16*

U.S. Cl. 526—259 **1 Claim**

1. A copolymer which comprises the copolymerization product of

(a) an ethylenically unsaturated compound, and

(b) a compound of formula I



(I)

wherein

X is —O— or —N(R^4)—,

Y is —O— or —N(R^5)—,

Z is C_2–C_6-alkylene, 2-hydroxypropylene or cyclohexylene,

m is 2,

n is 1,

R^1 is hydrogen or chlorine,

R^2 is tert-butyl,

R^3 is a —C(O)—C(R^6)=C(H)R^7 group, wherein R^6 and R^7 independently of one another are hydrogen or methyl, or

R^3, when Y is —N(R^5)—, forms together with R^5 a group —C(O)—CH=CH—C(O)—, and

R^4 and R^5 independently of one another are hydrogen or C_1–C_4-alkyl.

4,892,916

POLYMERIC THICKENERS AND THEIR PRODUCTION

Malcolm Hawe, and David Farrar, both of West Yorkshire, England, assignors to Allied Colloids Limited, England

Continuation of Ser. No. 894,343, Aug. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 766,097, Aug. 15, 1985, Pat. No. 4,702,844, and a continuation-in-part of Ser. No. 766,098, Aug. 15, 1985, abandoned. This application Sep. 22, 1987, Ser. No. 99,629

Claims priority, application United Kingdom, Aug. 15, 1984, 8420693; Aug. 15, 1984, 8420694; Aug. 15, 1984, 8420695; Jan. 30, 1985, 8502329; Aug. 12, 1985, 8520218; Feb. 14, 1986, 8603653; Feb. 14, 1986, 8603652; Feb. 14, 1986, 8603651

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[4] C08L *33/14*; C08F *265/04*

U.S. Cl. 526—304 **37 Claims**

1. A polymer that is substantially non swelling and insoluble in water but soluble or swellable in aqueous acid or alkali, and formed by oil in water emulsion polymerisation of a polymerisable mixture formed by mixing monomers consisting essentially of

(a) 5 to 90% by weight of monolthylenically unsaturated ionic monomer

(b) 5 to 90% by weight of monoethylenically unsaturated substantially non-ionic monomer

(c) 0.5 to 90% by weight of a monoethylenically unsaturated monomer that carries a pendant group —B_nR where B is ethylenoxy, n is zero or a positive integer and R is a hydrophobic hydrocarbyl group of at least 8 carbon atoms

(d) 0 to 0.2% by weight of cross linking monomer, and in which monomer (c) is an allyl ether of the formula CH_2=CR'CH_2O_nR where R' is hydrogen or methyl and in which B, n and R are as defined above and monomer (d)

consists essentially of polyethylenically unsaturated monomer.

4,892,917

ADHESIVE COMPOSITIONS FOR USE ON VINYL SUBSTRATES

Paul R. Mudge, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 9,450, Feb. 2, 1987, Pat. No. 4,753,846. This application Feb. 8, 1988, Ser. No. 153,310

Int. Cl.[4] C08F *20/10*

U.S. Cl. 526—318 **7 Claims**

1. Pressure sensitive adhesive compositions having a Tg of −45° to −25° C. suitable for application to plasticized polyvinyl chloride films consisting essentially of an emulsion polymer of 30–70% by weight of a vinyl ester of an alkanoic acid selected from the group consisting of vinyl formate, vinyl acetate, vinyl propionate, vinyl butyrate, vinyl isobutyrate, vinyl valerate, vinyl-2-ethyl-hexanoate, vinyl isooctanoate, vinylnonate, vinyl decanoate, vinyl pivalate, and vinyl versetate; 10–30% by weight ethylene: 20 to 40% by weight di-2-ethylhexylmaleate or the corresponding fumarate; 1 to 10% by weight of a mono-carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, monoethylmaleate, monobutyl maleate and monooctylmaleate; and 0 to 5% of a copolymerizable comonomer selected from the group consisting of acrylamide, allyl carbamate, N-vinylpyrrolidinone, diallyl adipate, trially/cyanurate, butanediol diacrylate, allyl methacrylic, hydroxyethyl acrylate, hydroxy propyl acrylate, and the corresponding methacrylates.

4,892,918

SECONDARY AMINE TERMINATED SILOXANES, METHODS FOR THEIR PREPARATION AND USE

Hong-Son Ryang, Camarillo, Calif., assignor to BASF Corporation, Parsippany, N.J.

Filed May 29, 1987, Ser. No. 55,312

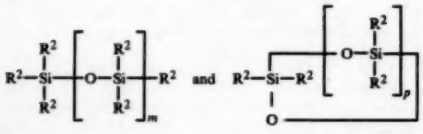
Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—15 **16 Claims**

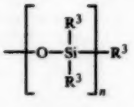
1. A process for the preparation of a secondary amine-functionalized organosilicone, comprising reacting

(a) an N substituted-N-alkenylmonoamine selected from the group consisting of N-aryl-N-alkenyl amines, N-alkyl-N-alkenylamines, N-cycloalkyl-N-alkenyl amines, and N-aralkyl-N-alkenyl amines, wherein the ethylenic unsaturation of said alkenyl amine is located at least two carbon atoms away from the amino nitrogen, with:

(b) an Si-H functional organosilicone selected from the group consisting of



where each R^2 is selected from the group consisting of hydrogen; alkyl; alkoxy; cyanoalkyl; halogenated alkyl; acetoxy; and substituted and unsubstituted cycloalkyl, aryl, and aralkyl; and



wherein m and n are natural numbers from 1 to about 10,000; wherein p is a natural number from 2 to about 20; wherein the sum m+n is less than about 10,000; wherein R^3 is selected from the group consisting of hydrogen; alkyl alkoxy; cyanoalkyl; halogenated alkyl; acetoxy; and substituted and unsubstituted cycloalkyl, aryl, and aralkyl; and wherein at least one of R^2 or R^3 is hydrogen; in the presence of,

(c) a hydrosilation reaction-promoting-catalyst present in an amount effective to catalyze the reaction between (a) and (b).

4,892,919

TEREPHTHALIC CONTAINING HYBRID CASTABLE RESINS

Robert H. Leitheiser, Port Washington, and Joan E. Karloske, Saukville, both of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Nov. 28, 1988, Ser. No. 276,802

Int. Cl.[4] C08G *18/62*

U.S. Cl. 528—48 **16 Claims**

1. A hybrid resin system which comprises an unsaturated polyester polyol, an unsaturated diluent, a diisocyanate and catalysts for promoting the urethane reaction between the polyol and the diisocyanate and the crosslinking reaction between the unsaturated bonds of the urethane and the diluent, the improvement comprising employing a terephthlate containing entity in the preparation of said polyester polyol as the principal aromatic diacid or diester component of said polyol.

4,892,920

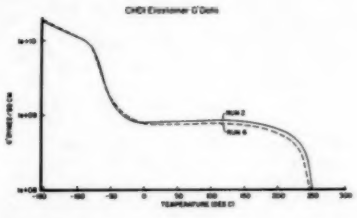
PROCESS FOR THE PREPARATION OF CYCLOHEXANEDIISOCYANATE CONTAINING POLYISOCYANATE PREPOLYMERS AND POLYURETHANES HAVING HIGH TEMPERATURE PERFORMANCE

Jeffrey R. Quay, Kutztown, and Jeremiah P. Casey, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 21, 1988, Ser. No. 274,539

Int. Cl.[4] C08G *18/10*

U.S. Cl. 528—61 **12 Claims**



1. In a process for producing a prepolymer suited for producing a polyurethane or polyurethane/urea elastomer wherein an aliphatic diisocyanate selected from the group consisting of cyclohexanediisocyanate or C_{1-4} alkyl-substituted cyclohexanediisocyanates is reacted with a long chain diol to produce a prepolymer and the prepolymer reacted with a diol or diamine chain extender to form a said polyurethane or polyurethane/urea elastomer, the improvement for producing such prepolymer and for enhancing physical properties in the resulting polyurethane or polyurethane/urea elastomer which comprises:

(a) reacting said aliphatic diisocyanate with said long chain diol at a temperature from about 40° to 100° C. and at a mole ratio of aliphatic diisocyanate to long chain diol from 6 to 20:1; and

(b) removing unreacted aliphatic diisocyanate from the reaction product to a level of less than about 0.15% by weight of the prepolymer.

4,892,921

PENDANT BENZAZOLE RIGID-ROD AROMATIC BENZOXAZOLE

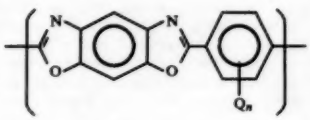
Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 85,094, Aug. 13, 1987, Pat. No. 4,835,246. This application Feb. 21, 1989, Ser. No. 313,766

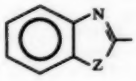
Int. Cl.[4] C08G *69/00, 73/00, 75/32*

U.S. Cl. 528—183 **5 Claims**

1. An aromatic heterocyclic polymer having repeating units of the formula



wherein n is 1 or 2, and Q is



wherein Z is —O— or —S—.

4,892,922

POLYESTER POLYMER CONTAINING THE RESIDUE OF A BENZOPYRAN COLORANT COMPOUND AND SHAPED ARTICLES PRODUCED THEREFROM

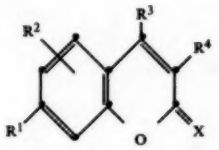
Max A. Weaver; Clarence A. Coates, Jr.; Wayne P. Pruett, all of Kingsport, and Samuel D. Hilbert, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 126,315, Nov. 30, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,814

Int. Cl.[4] C08G *63/20, 63/18, 63/16*

U.S. Cl. 528—190 **12 Claims**

1. A composition comprising molding or fiber grade polyester having copolymerized therein or reacted therewith the residue of a benzopyran compound having the formula

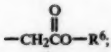


wherein

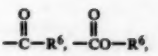
R^1 is amino or

R^2 is hydrogen, alkyl, —O—R^5, or halogen;

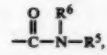
R^3 is hydrogen, an alkyl or aryl radical, or



R^4 is cyano,



carbamoyl,



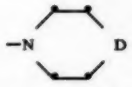
or a carbocyclic or heterocyclic aryl radical; and

X is oxo or imino; wherein

R^5 is alkenyl or an alkyl, cycloalkyl or aryl radical;

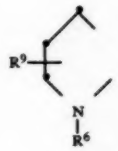
R^6 is hydrogen or an alkyl, cycloalkyl or aryl radical; and

collectively are (1) a group having the structure

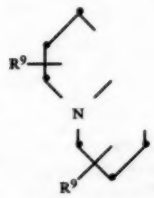


wherein D is —CH_2—, —O—, —S—, —SO_2—, —N(R^5)—,

or N(SO_2—R^6)—; (2) a divalent group having the structure



which with the carbon atoms of the benzopyran nucleus forms a fused, six-membered ring; or (3) a trivalent group having the structure



which with the carbon atoms of the benzopyran nucleus forms two fused, six-membered rings; wherein R^9 is hydrogen, an alkyl radical, hydroxy, —OR^5,

or halogen; provided the benzopyran compound bears at

least one substituent that is reactive with one of the monomers from which the polyester is derived, said residues absorbing radiation in the range of about 400 to 450 nm and being non-extractable from said polyester and stable under the polyester processing conditions.

4,892,923

POLYESTER COMPOSITIONS CONTAINING THE RESIDUE OF A NAPHTHOPYRAN COMPOUND AND SHAPED ARTICLES PRODUCED THEREFROM

Max A. Weaver; Wayne P. Pruett, both of Kingsport; Samuel D. Hilbert, Jonesborough, and Clarence A. Costes, Jr., Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

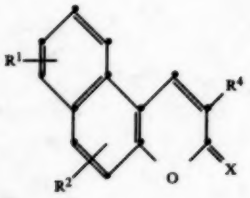
Continuation-in-part of Ser. No. 158,820, Feb. 22, 1988, abandoned. This application Dec. 21, 1988, Ser. No. 287,819

Int. Cl.[4] C08G *63/20, 63/18, 63/16*

U.S. Cl. 528—190 **8 Claims**

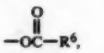
1. A composition comprising molding or fiber-grade polyester having reacted or copolymerized therein the residue of a naphthopyran compound having the formula

(I)



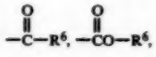
wherein

R^1 and R^2 are independently selected from hydrogen, $-R^5$, hydroxy, $-O-R^5$, halogen,

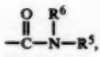


amino or

R^4 is cyano,



carbamoyl,



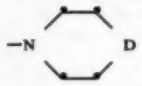
$-SO_2-R^6$, or an unsubstituted or substituted carbocyclic or heterocyclic or homocyclic aryl radical; and

X is oxo or imino; wherein

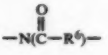
R^5 is alkenyl or an unsubstituted or substituted alkyl, cycloalkyl or aryl radical;

R^6 is hydrogen or an alkyl, cycloalkyl or aryl radical; and

collectively are a group having the structure



wherein D is $-CH_2-$, $-O-$, $-S-$, $-SO_2-$, $-N(R^5)-$,



or $-N(SO_2-R^6)-$; provided the naphthopyran compound bears at least one substituent that is reactive with one of the monomers from which the polyester polymer is derived, said naphthopyran residue absorbing radiation in the range of about 350 to 450 nm and being non-extractable from said polymer and stable under the polymer processing conditions.

4,892,924

POLYCARBONATE CONTAINING COMPOUND FROM BIS(3-PHENYL-4-HYDROXYPHENYL)

Kazuyoshi Shigematsu; Takashi Nakagawa, and Shuji Sakamoto, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 65,305, Jun. 18, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,036

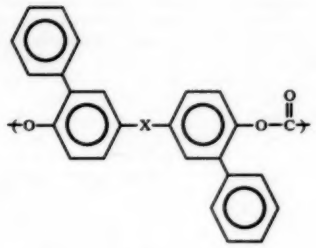
Claims priority, application Japan, Jun. 20, 1986, 61/142842; Jun. 20, 1986, 61/142843; Feb. 20, 1987, 62/37595

Int. Cl.[4] C08G *63/62*

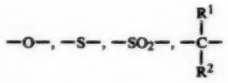
U.S. Cl. 528—196 **12 Claims**

1. A polycarbonate polymer exhibiting improved optical properties consisting essentially of repeating units represented by the following general formula:

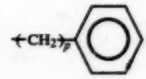
[I]



wherein: X is selected from

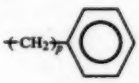


wherein: R^1 is selected from hydrogen atom; alkyl radicals of 1 to 6 carbon atoms; cycloalkyl radicals of 5 to 6 carbon atoms;



wherein p is an integer having a value of from 0 to 3; phenyl radicals substituted at para position by a substituent selected from alkoxy radicals of 1 to 5 carbon atoms, phenoxy radical, or halogen radicals; or p-biphenylyl radical, and R^2 is selected

from hydrogen atom; cycloalkyl radicals of 5 to 6 carbon atoms;



wherein p is an integer having a value of from 0 to 3; phenyl radicals substituted at para position by a substituent selected from alkoxy radicals of 1 to 5 carbon atoms, phenoxy radical, or halogen radicals; or p-biphenylyl radical, $-(CH_2)_q$ wherein q is an integer having a value of from 2 to 10, or

wherein r is an integer having a value of from 4 to 8, and having a reduced viscosity [η sp/c] of at least 0.2 dl/g as measured in methylene chloride at a concentration of 0.5 g/dl at 20° C.

4,892,925

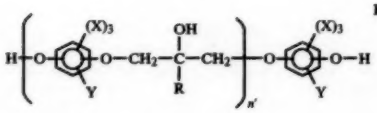
PROCESS FOR PREPARING PHENOLIC HYDROXYL-CONTAINING COMPOUNDS FROM 2,6-DIBROMO-3,5-DIALKYL-4-HYDROXYBENZYL ETHERS

Chun S. Wang, Lake Jackson, Tex.; Abel Mendoza, Midland, Mich., and David B. Fritz, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

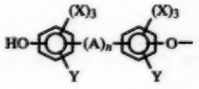
Filed Jan. 23, 1989, Ser. No. 300,460
Int. Cl.[4] C08G 65/38
U.S. Cl. 528—219 **8 Claims**

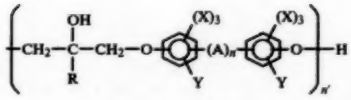
1. A process for preparing phenolic hydroxyl-containing compounds represented by the formulas VII, VIII, IX, X or XI

Formula VII

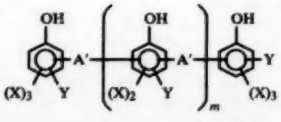


Formula VIII



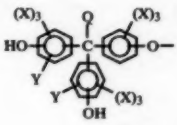


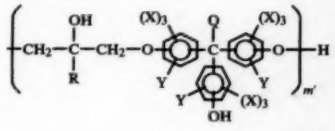
Formula IX



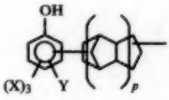
-continued

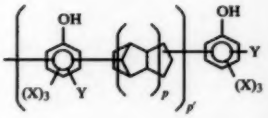
Formula X





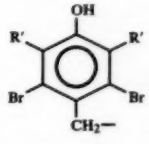
Formula XI





wherein each A is independently a divalent hydrocarbyl group having from 1 to about 12 carbon atoms; each A′ is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each Q is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each R is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; each X is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 12 carbon atoms or a halogen atom; each Y is independently hydrogen or a group represented by the following formula XII wherein R′ is an alkyl group having from 1 to about 10 carbon atoms with the proviso that at least one Y group is a group represented by formula XII;

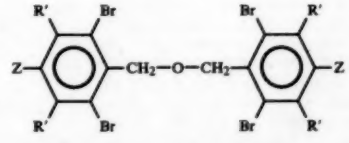
Formula XII



m has an average value from about 0.01 to about 8; m′ has an average value from zero to about 10; n has a value of zero or 1; n′ has an average value from about zero to about 3; each p has a value from zero to about 10; and each p′ has an average value from zero to about 8; which process comprises reacting

(A) one or more 2,6-dibromo-3,5-dialkyl-4-hydroxybenzyl ethers represented by the following formula I

Formula I

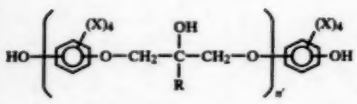


wherein each R′ is independently an alkyl group having from 1 to about 10 carbon atoms and each Z is a hydroxyl group; with

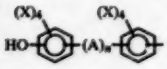
(B) one or more phenolic hydroxyl containing compounds

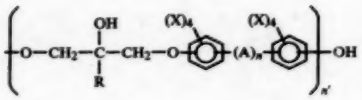
having an average of more than one phenolic hydroxyl group per molecule represented by the following formulas II, III, IV, V or VI

Formula II

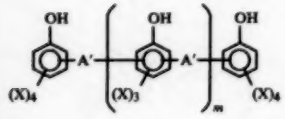


Formula III

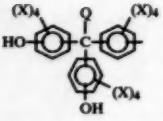


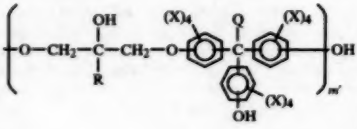


Formula IV

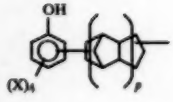


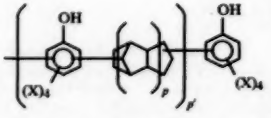
Formula V





Formula VI





wherein each A is independently a divalent hydrocarbyl group having from 1 to about 12 carbon atoms; each A' is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each Q is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each R is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; and each X is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 12 carbon atoms or a halogen atom; and

wherein components (A) and (B) are employed in quantities which provide a ratio of phenolic hydroxyl groups from 2,6-dibromo-3,5-dialkyl-4-hydroxybenzyl ether to aromatic rings from the phenolic hydroxyl containing compound of from about 0.05:1 to about 0.5:1.

4,892,926

THERMOTROPIC LIQUID CRYSTAL POLYESTERS AND A METHOD FOR THEIR PRODUCTION

Jun-ichi Suenaga; Hisayuki Naito, and Singo Sasaki, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Mar. 31, 1988, Ser. No. 175,795

Claims priority, application Japan, Mar. 31, 1987, 62-80454; Apr. 22, 1987, 62-99451

Int. Cl.[4] C08G *63/18, 63/16*

U.S. Cl. 528—305 **4 Claims**

1. A thermotropic liquid crystal polyester consisting essentially of:

(i) an ethylene glycol residue,

(ii) a terephthalic acid residue, and

(iii) a parahydroxybenzoic acid residue wherein the mol ratio of the ethylene glycol residue to the terephthalic acid residue is substantially about 1:1 and the mol ratio of the terephthalic acid residue to the parahydroxybenzoic acid residue is in the range of 15.85 to 22.78, wherein said polyester has an intrinsic viscosity of at least 0.5 dl/g measured in a 50:50 by weight solvent mixture of phenol and 1,1,2,2 -tetrachlorethane at 20° C., and a light transmittance at 530 nm of at least 80% at a light path length of 10 mm measured using a 0.4 wt% solution of said polyester in said solvent mixture.

4,892,927

α-AMINO-ε-CAPROLACTAM-MODIFIED POLYAMIDE OF DICARBOXYLIC ACIDS/DIAMINES

Rolf-Volker Meyer; Rolf Dhein; Michael Dietrich; Heinz Bonten; Hans-Detlef Heinz, all of Krefeld, and Peter-Rolf Müller, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 182,335

Claims priority, application Fed. Rep. of Germany, May 1, 1987, 3714609; Mar. 2, 1988, 3806632

Int. Cl.[4] C08G *69/14*

U.S. Cl. 528—324 **11 Claims**

1. A process for the preparation of aliphatic (co)polyamide by the polycondensation of polyamide-forming, predominantly aliphatic diamine and dicarboxylic acid or salts thereof or polyamide forming amino acid, with or without ω-lactams, characterised in that from 0.02 to 1% by weight of α-amino -ε-caprolactam (ACL) is added to the polyamide forming mixture which is polymerised.

4,892,928

HYDROGENATION PROCESS

Ronald J. Hoxmeier, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 12, 1988, Ser. No. 256,537

Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—338 **14 Claims**

1. A process for selectively hydrogenating the ethylenic unsaturation in a polymer comprising ethylenic unsaturation and cyano groups comprising the steps of:

(a) contacting a polymer comprising polymerized conjugated diene units having ethylenic unsaturation and cyano groups selected from polymerized nitrile units and grafted cyano compounds with hydrogen in a first suitable solvent, and in the presence of a catalyst prepared by combining one or more palladium carboxylates with one or more aluminum compounds, selected from aluminum hydrides and aluminum alkyls, in a second suitable solvent, which second suitable solvent may be the same or different from said first suitable solvent;

(b) maintaining the contact in step (a) for a sufficient period of time permit conversion of at least a portion of the ethylenic unsaturation contained in said polymer; and

(c) recovering an at least partially hydrogenated polymer.

4,892,929

MELT STABILIZATION OF POLY ARYLENE SULFIDE KETONE

Jon F. Geibel, Bartlesville, Okla.; Roger G. Gaughan, Piscataway, N.J., and Michael D. Cliffton, Kingsport, Tenn., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 16, 1988, Ser. No. 272,620

Int. Cl.[4] C08G 6/00, 75/16

U.S. Cl. 528—480 35 Claims

1. A method to provide a melt stable polymeric resin while simultaneously increasing its molecular weight comprising:

heating a first particulate resin selected from the group consisting of poly(arylene sulfide ketone) and poly(arylene sulfide diketone), while in the presence of a gaseous oxidizing atmosphere, to a temperature at least about 150° C. (302° F.) but below the melting point of said first particulate resin, for time sufficient to produce a second particulate resin, wherein the melt stability of said second particulate resin is superior to that of said first particulate resin, and wherein the molecular weight of said second particulate resin is greater than that of said first particulate resin.

4,892,930

METHOD FOR LOWERING THE MELT CRYSTALLIZATION TEMPERATURE OF AN ARYLENE SULFIDE POLYMER WITH ORGANIC PHOSPHITE COMPOSITION

Yeon F. Liang, Kohler, Wis., assignor to Phillips Petroleum Company, Bartlesville, Okla.

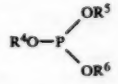
Filed Jul. 29, 1988, Ser. No. 226,029

Int. Cl.[4] C08G 75/16

U.S. Cl. 528—487 13 Claims

1. A process for lowering the melt crystallization temperature (T_{mc}) in an arylene sulfide polymer composition which comprises incorporating in said polymer an effective amount of an organic phosphite selected from the group consisting of

(a) polyol- and glycol-substituted organic phosphites of the formula



where R^4, R^5 and R^6 are the same or different and are alkylene oxide groups having 2 to 6 carbon atoms;

(b) 100 percent polypropoxylated phosphoric acid;

(c) tetraphenyl dipropylene glycolphosphite;

(d) di(stearyl) pentaerythritol diphosphite; and

(e) polymeric tris(nonylphenyl) phosphite.

4,892,931

PURIFICATION OF POLYCARBONATE WITH EXTRACTANT/SWELLING AGENT AND ELEVATED PRESSURE AND TEMPERATURE

Manfred Knerr, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 937,382, Dec. 3, 1986, abandoned, which is a continuation of Ser. No. 748,865, Jun. 26, 1985, abandoned. This application May 31, 1988, Ser. No. 204,929

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425125

Int. Cl.[4] C08G 63/62

U.S. Cl. 528—493 6 Claims

1. A process for the non-destructive removal of unwanted residual constituents from solid polycarbonate polymer by the application of heat and pressure, comprising the following steps:

(a) adding an extractant to the solid polycarbonate polymer which has no significant dissolving effect on the polymer and which is selected from the group consisting of acetone, methyl ethyl ketone, diethyl ketone, toluene, xylene, ethanol, and super critical carbon dioxide;

(b) changing the morphology of the polymer by swelling to widen the space between the polymeric chains comprising the solid polymer to accelerate the diffusion of unwanted residual constituents into the extractant at elevated pressure and at a temperature in the range from ambient temperature to the glass transition temperature of the polymer;

(c) separating the extractant enriched with residual constituents;

(d) evaporating of the residual extractant together with the residual constituents therein by the application of heat.

4,892,932

METHOD FOR SPRAY DRYING POLYMER EMULSIONS AND SOLUTIONS

Hubert Rauch, Weiterstadt, and Peter J. Arndt, Seeheim-Jugenheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,381

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807543

Int. Cl.[4] C08J 3/12, 3/16

U.S. Cl. 528—499 10 Claims

1. A method for making a spray dried polymer powder, which method comprises atomizing water and an aqueous dispersion or solution of a polymer in a warm air stream, the amount of water atomized per unit time being smaller than the amount of dispersion or solution, and separating the polymer powder from the warm air stream.

4,892,933

MONOCLONAL ANTIBODY FOR COLORECTAL CARCINOMA

Ronald R. Salem, Brookline; Peter Thomas, Pembroke; Norman Zamcheck, W. Newton, and Glenn Steele, Swampscott, all of Mass., assignors to New England Deaconess Hospital Corporation and Mallory Institute of Pathology Foundation, both of Boston, Mass.

Filed Apr. 20, 1988, Ser. No. 183,831

Int. Cl.[4] C07K 15/00; C12N 5/00

U.S. Cl. 530—387 9 Claims

4. A hybridoma which produces a monoclonal antibody that specifically binds the CC glycoprotein, said glycoprotein having a molecular weight of 160,000 daltons, being found on the surface of undifferentiated colorectal carcinomas cells, and not specifically binding with any of CEA, CA 19.9, alpha-1-acid glycoprotein, NCA, or with blood group substances A, B, and H.

4,892,934

PROCESS FOR PREPARING HYBRIDOMA CELLS WHICH PRODUCE TUMOR-SPECIFIC MONOCLONAL ANTIBODIES

Hajime Yoshida, and Nobuo Hanai, both of Kanagawa, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 709,967, Mar. 11, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 244,601

Claims priority, application Japan, Mar. 12, 1984, 59-46683

Int. Cl.[4] C07K 15/14; A61K 39/395; C12N 15/00

U.S. Cl. 530—387 7 Claims

1. In the process for producing mouse monoclonal antibodies which bind to tumer-associated antigens of human carcinomas selected from the group consisting of lung and stomach carcinomas by immunizing neonatal mice to the antigens from said carcinomas, the improvement which comprises the step of tolerizing said neonatal mice to normal adult cell antigens by the immunization of said mice to normal human adult cell antigens prior to the conventional immunizing of said mice with said cancer antigens to form said mouse monoclonal antibodies.

4,892,935

ANTI-HUMAN PULMONARY CARCINOMA MONOCLONAL ANTIBODY

Hajime Yoshida, Sagamihara, Japan; Nobuo Hanai, Mercer Island, Wash., and Kenya Shitara, Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1987, Ser. No. 70,052

Claims priority, application Japan, Jul. 11, 1986, 61-163415

Int. Cl.[4] A61K *39/395*; C07K *16/14*

U.S. Cl. 530—387 3 Claims

1. An anti-human pulmonary carcinoma antigen specific monoclonal antibody which has the same antigen specificity and binding characteristics as antibodies produced by hybridoma cell line ECACC 86070306, and which belongs to the class IgM, is capable of reacting with human squamous cell lung carcinoma, lung adenocarcinoma and large cell lung carcinoma; is non-reactive with human small cell lung carcinoma and normal human lung cell, and the binding activity of which is substantially unaffected with rabbit anti-β_2 microglobulin antibody, rabbit anti-CEA antibody and rabbit anti-AFP antibody.

4,892,936

PROCESS FOR THE PREPARATION OR α-AZO ESTERS

Masato Tanaka, and Toshiyasu Sakakura, both of Ibaraki, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

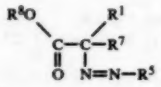
Division of Ser. No. 883,808, Jul. 7, 1986, Pat. No. 4,772,714. This application Mar. 23, 1988, Ser. No. 171,976

Claims priority, application Japan, Jul. 8, 1985, 60-149727; Jul. 8, 1985, 60-149728; Jul. 8, 1985, 60-149729

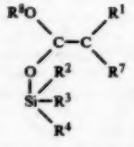
Int. Cl.[4] C07C *107/02, 45/00*

U.S. Cl. 534—595 7 Claims

1. A process for the preparation of a α-azo ester of the formula



wherein R^1 and R^7 are each independently a member selected from the group consisting of C_{1-8} alkyl, C_{7-8} aralkyl, C_{6-10} aryl, C_{2-8} alkenyl, C_{3-5} heteroaryl and substituted derivatives thereof in which the substituent is selected from the group consisting of halogen, alkoxy, alkoxycarbonyl, dialkylamino, β-indolyl, dialkoxymethyl, thioalkoxy, nitro and cyano; R^2, R^3, R^4 and R^8 are each a member selected from the group consisting of C_{1-8} alkyl, C_{7-8} aralkyl, and C_{6-10} aryl; R^5 is a member selected from the group consisting of phenyl, chlorophenyl, bromophenyl, nitrophenyl, tolyl, anisyl, formylphenyl, ethoxycarboxylphenyl, dimethoxymethylphenyl, naphthyl, pyridyl, furyl, thienyl and 4,4'-biphenylenyl; and X is a member selected from the group consisting of Cl, HSO_4, NO_3, ClO_4, BF_4, $B(C_6H_5)_4$, PF_6, CH_3CO_2, $\frac{1}{2}ZnCl_4$, $\frac{1}{2}SnCl_6$, $\frac{1}{2}HgCl_4$, $\frac{1}{2}CdCl_4$, $1/3Fe(CN)_6$ and $FeCl_4$, which comprises reacting in a solvent a ketene silyl acetal of the formula



with a diazonium salt of the formula $R^5— N = N — X$.

4,892,937

TETRA-SUBSTITUTED ARYL CYCLIC FORMAZAN DYES

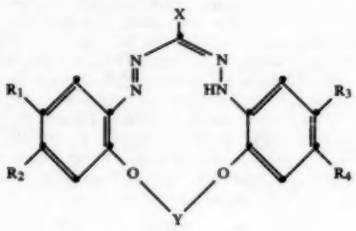
Mary H. Delton, Honeoye Falls, and Shari L. Eiff, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,341

Int. Cl.[4] D06P *50/04*; G01N *21/78, 33/20, 33/52*

U.S. Cl. 534—652 3 Claims

1. A dye having the structure



wherein

X represents CN or NO_2;

Y represents CH_2CH_2, $CH_2CH_2CH_2$, or $CH_2CH_2—O—CH_2CH_2$; and

R_1, R_2, R_3 and R_4 each independently represent butyl, halogen, alkoxy or NO_2.

4,892,938

METHOD FOR THE RECOVERY OF STEVIOSIDES FROM PLANT RAW MATERIAL

Roger H. Giovanetto, 2220 39 Avenue NE, T2E6P7 Calgary, Alberta, Canada

Filed Jul. 20, 1988, Ser. No. 221,811

Claims priority, application European Pat. Off., Jul. 21, 1987, 87110541.7

Int. Cl.[4] C07G *3/00*; C07H *1/06*

U.S. Cl. 536—18.5 15 Claims

1. A method for recovering steviosides from dried plant material of *Stevia rebaudiana* Bertoni, comprising treating dried plant material of *Stevia rebaudiana* Bertoni by stirring in a solvent consisting of water at a temperature ranging from room temperature to about 65° C., filtering or centrifuging the treated plant material to obtain an aqueous extract, treating the aqueous extract with calcium hydroxide to form a precipitate, filtering and centrifuging the treated extract to separate the precipitate, sequentially treating the separated precipitate three times, first with a strongly acidic ion exchange resin and then with a weakly basic ion exchange resin, and thereafter filtering and drying the treated precipitate to obtain a product containing steviosides without employing any solvents other than water.

4,892,939

OLIGOPEPTIDYL-5-FLUOROURIDINE COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Katsumi Sakai, Tokyo; Kiyoaki Chou, and Takeshi Endo, both of Nakanilkawa, all of Japan, assignors to Fuji Kagaku Kogyo Kabushiki Kaisha, Toyama, Japan

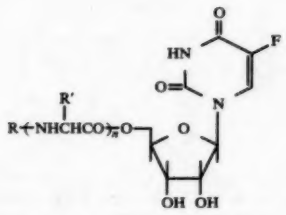
PCT No. PCT/JP86/00278, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO87/07276, PCT Pub. Date Dec. 3, 1987

PCT Filed May 30, 1986, Ser. No. 148,507

Int. Cl.[4] C07H *19/06*

U.S. Cl. 536—23 24 Claims

1. 5'-O-oligopeptidyl-5-fluorouridine compounds of the general formula:



(I)

wherein n is an integer of 1 to 3, R′ stands for a straight or branched chain alkyl group having 1 to 4 carbon atoms or a benzyl group, and R stands for an amino acid residue selected from the group consisting of alanyl, phenylalanyl, valyl, tyrosyl, 3,4-dihydroxyphenylalanyl and lysyl groups, or pharmacologically acceptable salts thereof.

4,892,940

AROMATIC NAPHTHYL COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN HUMAN AND VETERINARY MEDICINE AND IN COSMETIC COMPOSITIONS

Jean Maignan, Tremblay Les Gonesse; Gérard Lang, Saint Gratien; Gérard Malle, Villiers Sur Morin; Serge Restle, Aulnay-Sous-Boise, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

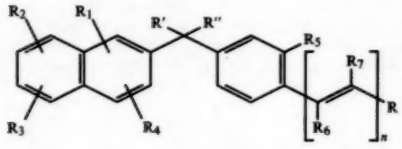
Filed May 22, 1987, Ser. No. 52,930

Claims priority, application France, May 23, 1986, 86 07405

Int. Cl.[4] C07C *69/80, 43/20;* **A61K** *7/48, 31/19*

U.S. Cl. 536—55.2 **28 Claims**

1. An aromatic naphthyl compound having the formula



(I)

wherein

n is 0 or 1,

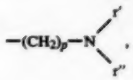
R′ represents hydrogen, OH, acyloxy, lower alkoxy or NH_2,

R″ represents hydrogen or lower alkoxy or R′ and R″ taken together from an oxo radical, a methano radical or a hydroxyimino radical,

R represents $—CH_2OH$ or $—COR_8$,

R_8 represents hydrogen, $—OR_9$ or

R_9 represents hydrogen, linear or branched alkyl having 1–20 carbon atoms, mono or polyhydroxy alkyl, aryl, aryl substituted by halogen, hydroxy or nitro, aralkyl, the residue of a sugar or a radical having the formula



p is 1,2 or 3,

r′ and r″ each independently represent hydrogen, lower alkyl, monohydroxyalkyl, monohydroxyalkyl interrupted by a heteroatom, polyhydroxyalkyl, aryl, aryl substituted by halogen, hydroxy or nitro, benzyl, the residue of an amino acid or the residue of an aminated sugar, or r′ and r″ taken together form a heterocycle,

R_1, R_2, R_3 and R_4 each independently represent hydrogen, lower alkyl, alkoxy having 1–4 carbon atoms, lower fluoroalkoxy, CF_3, cycloalkyl. lower acyl, halogen, OH, amino, lower acylamino or lower alkoxy carbonyl,

the substituents R_1 to R_4 being able to be distributed on one of the two rings or on both at the same time,

R_5, R_6 and R_7 represent hydrogen or methyl or when n=1, R_5 and R_7 taken together can form with the benzene ring a naphthalene ring, and

the salts of said compound of formula I or its geometric or optical isomers.

4,892,941

PORPHYRINS

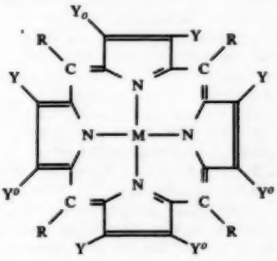
David H. Dolphin, 4464 West 12th Avenue, Vancouver, British Columbia, Canada V6R 2R2 ; Taku Nakano, 950 Sata, Tamaki-cho, Watarai-gun, Mie-Ken 519-04, Japan (0596582524); Thomas K. Kirk, 7814 Oxtrail Way, Verona, Wis. 53593; Tilak P. Wijesekera, 2902 E. 54th Avenue, Vancouver, B.C., Canada V5S 1Y5 ; Roberta L. Farrell, 177 Hobart St., Danvers, Mass. 01923, and Theodore E. Malone, 153 Thoreau St., Apt. 2, Concord, Mass. 01742

Continuation-in-part of Ser. No. 39,566, Apr. 17, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 181,859

Int. Cl.[4] C07D *487/22*

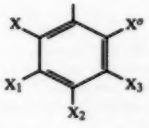
U.S. Cl. 540—145 **28 Claims**

1. A compound of the formula:



I

wherein M is a transition metal capable of sustaining oxidation, said M being optionally axially ligated to a ligand, each Y and Y^o independently H, fluoro or chloro, each R ring is



X and X^o are independently H or a non-water solubilizing electronegative group, and X_1, X_2 and X_3 are independently H or an electronegative group, subject to the provisos that:

(1) when none of X_1, X_2 and X_3 is in a water solubilizing group, then at least one of Y and Y^o on each porphyrin ring is other than H,

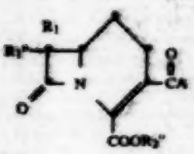
(2) when Y and Y^o are both H, at least one but not more than two of X_1, X_2 and X_3 is water solubilizing group and at least two of X, X^o, X_1, X_2 and X_3 is a non-water solubilizing electronegative group, or the water soluble salts thereof in which said water solubilizing groups are in corresponding water soluble salt form,

(3) no more than two of X_1, X_2 and X_3 is a water solubilizing group,

or a compound of the formula I in which the water solubilizing groups are in water soluble salt form.

4,892,942
1-CARBACEPHALOSPORIN ANTIBIOTICS
John R. Nhaven, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 65,908, Jun. 26, 1987, Pat. No. 4,791,104, which is a continuation-in-part of Ser. No. 814,943, Dec. 30, 1985, abandoned. This application Aug. 24, 1988, Ser. No. 236,080
Int. Cl.[4] C07D 205/08
U.S. Cl. 540—209 7 Claims

1. The compound of the formula

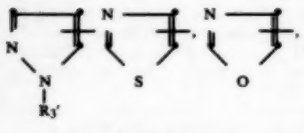


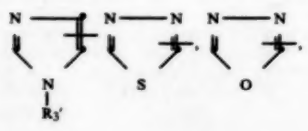
wherein

R_1' is amino or a protected amino group, R_1 is hydrogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, or formamido; R_2" is hydrogen or a carboxy-protecting group; and

A is hydroxy, halo, azido, 2-(tri-C_1–C_4 alkylsilyl)ethoxy, C_1–C_6 alkoxy, C_2–C_6 alkenyloxy, C_2–C_6 alkinyloxy, C_1–C_4 alkoxycarbonyloxy, phenoxy, or phenoxy substituted by one or two of the same or different groups selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, methylenedioxy, halo, hydroxy, amino, C_1–C_4 alkylamino, di(C_1–C_4 alkyl-)amino, C_1–C_4 alkanoylamino, carboxy, carbamoyl, cyano, trifluoromethyl, or C_1–C_4 alkanoyl;

or A is C_1–C_6 alkoxy substituted by one or two of the same or different groups selected from among hydroxy, amino, C_1–C_4 alkylamino, di(C_1–C_4 alkyl)amino, C_1–C_4alkanoylamino, halo, C_1–C_4 alkoxy, C_1–C_4 alkylthio, cyano, carboxy, C_1–C_4 alkoxycarbonyl, carbamoyl, carbamoyloxy, N-(C_1–C_4 alkyl)carbamoyloxy, N,N-di-(C_1–C_4 alkyl)carbamoyloxy, C_1–C_4 alkoxycarbonyloxy, phenoxycarbonyloxy, C_1–C_4 alkoxycarbonylamino, phenoxycarbonylamino, N-(C_1–C_4 alkyl)carbamoylamino, N,N-di-(C_1–C_4 alkyl)carbamoylamino, N-phenylcarbamoylamino, anilino, substituted anilino, phenyl, substituted phenyl, where said substituted anilino and substituted phenyl groups are substituted on the phenyl ring by one or two of the same or different groups selected from among C_1–C_4 alkyl, C_1–C_4 alkoxy, methlenedioxy, halo, hydroxy, amino, C_1–C_4 alkylamino, di-(C_1–C_4 alkyl-)amino, C_1–C_4 alkanoylamino carboxy, carbamoyl, cyano, trifluoromethyl, or C_1–C_4 alkanoyl; a hetrocyclic amino group R_3NH— wherein R_3 is thienyl, furyl or a 5-membered nitrogen containing heterocyclic ring represented by the formulae





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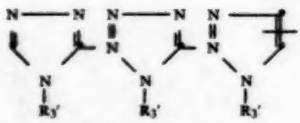
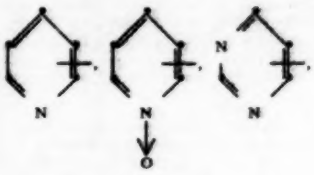
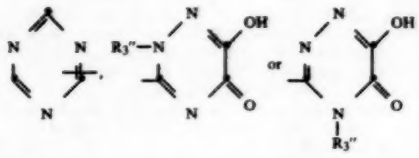
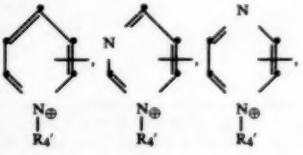


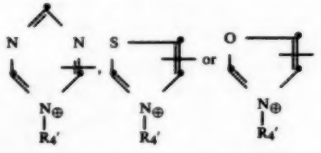
wherein R_3, is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkyl substituted by carboxy, sulfo, or di(C_1–C_4 alkyl)amino; or R_3 is a 6-membered nitrogen-containing ring represented by the formulae





wherein R_3" is hydrogen or C_1–C_4 alkyl; or a thio group R_3'S— wherein R_3 is phenyl, substituted phenyl as defined above or R_3 as defined above; or a quaternary heterocyclic group R_4'⊕X⊖ wherein R_4'⊕ is a nitrogen containing hetrocyclic represented by the formulae





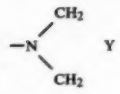
wherein R_4' is C_1–C_4 alkyl, benzyl, or —CH_2COCH_3, and X⊖ is a halide, sulfate, or nitrate anion; or R_4'⊕—S—X⊖ wherein R_4'⊕ and X⊖ are as defined above; or C_1–C_6 alkoxy substituted by a heterocyclic group R_3 as defined above;

or A is an amino group represented by the formula

—N(R')(R")

wherein R' and R" are independently hydrogen, phenyl, substituted phenyl as defined above, C_1–C_4 alkyl, C_1–C_4 alkyl substituted by one or two of the same or different groups selected from among halo, hydroxy, C_1–C_4 alkanoyloxy, C_1–C_4 alkylsulfonyloxy, amino, or C_1–C_4

alkanoylamino; or R′ and R″ can be taken together with the nitrogen atom to which they are bonded to form a 5–7 membered ring represented by the formula



wherein

Y is $(CH_2)_p$ or $—CH_2—Y'—CH_2—$ wherein p is 2–4 and Y′ is O, S, or NR‴ wherein R‴ is hydrogen or C_1–C_4 alkyl; or R′ is hydrogen and R″ is C_1–C_4 alkyl substituted by a heterocyclic R3, or a heterocyclic amino group $R_3NH—$, or a thio group $R_3^*S—$, or a quaternary heterocyclic group $R_4^*\oplus X\ominus$, wherein R_3, R_3, $R_4^*\oplus$ and $X\ominus$ have the same meanings as defined above;

or A is a heterocyclic amino group R3NHwherein R_3 is as defined above, phenyl, or substituted phenyl as defined above;

or A is C_1–C_4 alkyl, or C_1–C_4 alkyl monosubstituted by hydroxy, C_1–C_4 alkanoyloxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, halogen, carboxy, cyano amino, C_1–C_4 alkylamino, di-(C_1–C_4 alkyl)amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylsulfonylamino, C_1–C_4 alkylsulfonyloxy, phenyl, substituted phenyl as defined above, phenylthio, phenoxy, substituted phenoxy as defined above, anilino, substituted anilino as defined above, a heterocyclic group R_3, a heterocyclic amino group R_3NH, a thio group $R_3^*S—$, or a quaternary heterocyclc group $R_4^*\oplus KX\ominus$ or $R_4^*\oplus—S—X\oplus$, wherein R_3, R_3^*, $R_4^*\oplus$, and $X\ominus$ are as defined above;

or A is phenyl, thienyl, furyl, pyridyl, pyrimidyl, imidazoyl, pyrazolyl, tetrazolyl, oxazolyl, thiazol, thiadiazolyl or oxadiazolyl, and said phenyl or heterocycle substituted by one or two of the same or different substitutents selected from C_1–C_4 alkyl, C_1 –C_4 alkoxy, halogen, amino, or hydroxy;

or A is a group of the formula $—COR_6$ wherein R_6 is hydrogen, hydroxy, C_1–C_4 alkoxy, phenoxy, substituted phenoxy as defined above, tri-(C_1–C_4 alkyl)silyloxy, amino, C_1–C_4 alkylamino, di-(C_1–C_4 alkyl)amino, phenyl, substituted phenyl as defined above, or C_1–C_4 alkyl;

or A is the group $—CH_2—\oplus R_4$ wherein $\oplus R_4$ is pyridinium, or a substituted pyridinium group substituted by one or two of the same or different groups selected from among C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, hydroxy, halogen, trifluromethyl, cyano, carboxy, carbamoyl, amino, or C_1–C_4 alkoxycarbonyl; or the pyridinium ring is substituted on adjacent carbon atoms with adivalent alkylene group represented by the formula CH_{2p}, wherein p′ is 3–5, or the divalent alkylene group is interrupted by an O, S, or one or two N atoms and in addition can contain one or two double bounds and can be substituted in either ring by one or two of the same or different substituents selected from the groups defined above when $\oplus R_4$ is a substituted pyridine; or $\oplus R_4$ is a thiazolium ring or a substituted thiazolium ring substituted by one or two of the same or different groups, amino, C_1–C_4 alkyl, C_1–C_4 alkylthio, C_1–C_4 alkoxy, C_1–C_4 alkyl substituted by hydroxy, C_1–C_4 alkanoyloxy, C_1–C_4 alkylsulfonyloxy, halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, or amino, or the thiazolium ring is substituted on the adjacent carbon atoms with a divalent alkylene group represented by the formula CH_2p' wherein p′ is 3–5; and when R_2 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

4,892,943

FUSED BICYCLIC IMIDES WITH PSYCHOTROPIC ACTIVITY

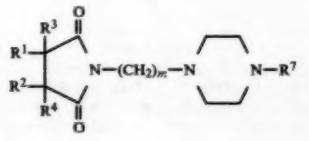
Magid A. Abou-Gharbia, Wilmington, Del., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 909,049, Sep. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 892,160, Jul. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 787,887, Oct. 16, 1985, abandoned. This application Aug. 26, 1988, Ser. No. 237,106

Int. Cl.[4] A61K *31/495;* **C07D** *401/06, 401/14*

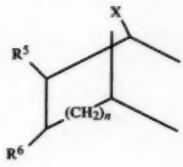
U.S. Cl. 540—575 **34 Claims**

1. A compound having the formula:



wherein

R^1 and R^2 represent the structure:



R^3 and R^4 are hydrogen;

R^5 and R^6 are hydrogen, or R^5 and R^6 taken together form a 3–6 membered carbocyclic ring or a cyclobutenyl ring; with the proviso that when R^3, R^4, R^5 and R^6 are hydrogen, n is other than zero;

m is 2–4;

n is 0–4;

X is lower alkylene, vinylene or O;

R^7 is unsubstituted or monosubstituted phenyl, 2-pyridinyl, 2-pyrimidinyl, 2-pyrazinyl or 3-pyridazinyl; where the substituents are selected from the group lower alkyl, lower alkoxy, halo, cyano, nitro and trifluoromethyl;

and the pharmaceutically acceptable salts thereof.

4,892,944

PROCESS FOR PRODUCING QUATERNARY SALTS

Shoichiro Mori; Kazuhiko Ida, and Makoto Ue, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,524

Claims priority, application Japan, May 13, 1987, 62-116463; May 14, 1987, 62-117380; May 22, 1987, 62-125427; May 22, 1987, 62-125428

Int. Cl.[4] C07C *85/24*

U.S. Cl. 544—107 **8 Claims**

1. A process for producing a quaternary salt comprising

(a) a first step of reacting (a1) one number selected from the group consisting of tertiary alkylamines, N,N,N′,N′-tetramethylethylenediamine, N-alkylpyrrolidines, N-alkylpiperidines, N-alkylhexamethyleneimines, N-alkylmorpholines, N,N′-dialkylpiperazines, 1,5-diazabicyclo[4,3,0]-5-nonene, 1,8-diazabicyclo[5,4,0]-7-undecene, alkylpyridines, 4-dimethylaminopyridine, picoline, N-alkylimidazoles, N-methylbenzimidazole, quinoline, 4,4,-dipyridyl, trialkylphosphines, tricyclohexylphosphine, 1,2-bis(dimethylphosphine)ethane, triphenylphosphine, tribenzylphosphine, dialkylphenylphosphines, alkyl-

diphenylphosphine, 1-ethylphosphoran, 1-phenylphosphoran, 1-phenylphosphane, and 1-phenylphosphate, with (a2) a carbonic acid dialkylester at a temperature of 20° C. to 200° C. to produce a corresponding quaternary carbonate, and

(b) a second step of mixing the quaternary carbonate thus formed with an acid or an acidic phenol, while removing carbon dioxide generated from the system, to replace the carbonate anion with the corresponding acid or phenyl anion.

4,892,945

ISOINDOLINE PIGMENTS CONTAINING AT LEAST ONE TRIAZOLOPYRIMIDONE RADICAL

Max Jost, Oberwil; Kurt Burdeska, Basle, and Jost von der Crone, Arconciel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

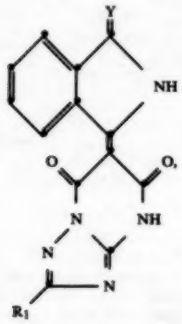
Filed Dec. 8, 1988, Ser. No. 281,417

Claims priority, application Switzerland, Dec. 21, 1987, 4986/87-3

Int. Cl.[4] C09B 57/04

U.S. Cl. 544—263 **3 Claims**

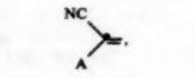
1. An isoindoline of formula I



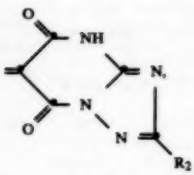
(I)

wherein

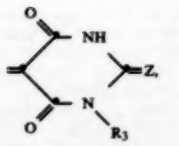
Y is a radical of formula II, III, IV, IVa, V or VI



(II)

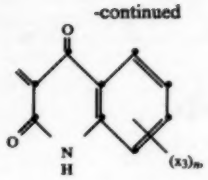


(III)

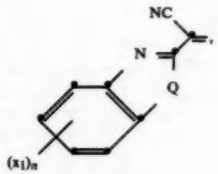


(IV)

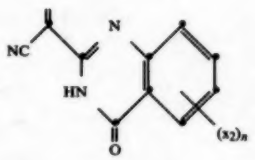
-continued



(IVa)



(V)



(VI)

wherein R_1 and R_2 are each independently of the other —H, —$CONH_2$, —COO—C_1–C_4alkyl, C_1–C_3alkyl, phenyl or phenyl which is substituted by one to three identical or different members selected from the group consisting of halogen, C_1–C_3alkyl and C_1–C_3alkoxy, R_3 is —H, C_1–C_4alkyl, phenyl or phenyl which is substituted by one or two identical or different members selected from the group consisting of halogen, C_1–C_3-alkyl and C_1–C_3alkoxy, Z and Q are O, S or NH, and A is a group of formula —CN, —COO—C_1–C_4alkyl or —$CONHR_4$, in which R_4 is —H, C_1–C_4alkyl, benzyl, phenyl or phenyl which is substituted by one or more identical or different members selected from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4alkoxy, a group —COR_5, —NH-CO—C_1–C_4alkyl and

wherein R_5 is C_1–C_4-alkoxy, —NH_2 or —NH—C_1–C_4alkyl, and R_6 is hydrogen, halogen or C_1–C_4alkyl, and R_4 is also naphthyl or naphthyl substituted by one or two halogen atoms or one or two methyl or methoxy groups, and x_1, x_2 and x_3 are each independently halogen, methyl, methoxy or —NH-$COCH_3$, and n is 0, 1 or 2.

4,892,946

AGRICULTURAL SULFONAMIDES

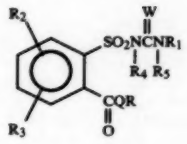
George Levitt, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 171,355, Jul. 23, 1980, Pat. No. 4,305,884, and a continuation-in-part of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506. This application Nov. 24, 1980, Ser. No. 209,307

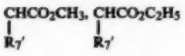
Int. Cl.[4] C07D 239/28, 239, 30

U.S. Cl. 544—321 **50 Claims**

1. A compound selected from

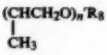


wherein
Q is O;
R is C_1–C_{12} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_6 alkyl substituted with one to four substituents selected from 0–3 atoms of F, Cl or Br, 0–2 methoxy groups and 0–1 cyano groups, CH_2CN,

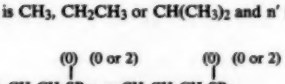


where R_7' is H or CH_3, C_3–C_6 alkenyl substituted with 1–3 atoms of F, Cl or Br, C_3–C_6 alkynyl substituted with one of F, Cl or Br, C_5–C_8 cycloalkyl, C_5–C_8 cycloalkenyl, C_5–C_6 cycloalkyl substituted with OCH_3, alkyl of C_2–C_4, F, Cl or Br or one to four methyl groups, C_4–C_{10} cycloalkylalkyl or C_4–C_8 cycloalkylalkyl with 1–2 CH_3;
R is also H, M, $CH_2CH_2OR_7$, $CH_2CH_2CH_2OR_7$,

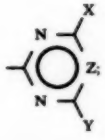
where R_7 is CH_2CH_3 or $CH(CH_3)_2$, CH_2OR_8' where R_8' is CH_3, CH_2CH_3, $CH(CH_3)_2$, $CH_2CH_2OCH_3$, or $CH_2CH_2OCH_2CH_3$, $(CH_2CH_2O)_{n'}R_8$,



where R_8 is CH_3, CH_2CH_3 or $CH(CH_3)_2$ and n' is



where R_{12} is CH_3, CH_2CH_3 or $CH(CH_3)_2$ and provided that R has a total number of carbon atoms ≦13;
R_1 is



R_2 is NCO,

CF_3SO_2NH or CH_3SO_2NH;
B is C_1–C_4 alkyl optionally substituted with 1–3 atoms of F, Cl, Br or a single OCH_3 group or C_2–C_4 alkenyl;
B^I is C_1–C_4 alkyl or C_3–C_4 alkenyl;
B^{II} is C_1–C_4 alkyl optionally substituted with $CH_2CH_2OCH_3$, $CH_2CH_2OCH_2CH_3$ or 1–3 atoms of F, Cl or Br, or C_3–C_4 alkenyl;
B^{III} is C_1–C_4 alkyl optionally substituted with Cl or OCH_3 or C_3–C_4 alkenyl;
R_3 is H, Cl, Br, F or CH_3;
R_4 is H or CH_3;
R_5 is H, CH_3 or OCH_3;
M is an alkali metal;
W is oxygen or sulfur;
X is H, Cl, CH_3, OCH_3, OCH_2CH_3, $OCH_2CH_2OCH_3$, CH_2OCH_3 or $CH_2OCH_2CH_3$;
Y is H, F, Cl, Br, C_1–C_4 alkyl,

where L is NH_2, OH, NCH_3, $NH(C_1$–C_4 alkyl), $N(C_1$–C_4 alkyl)$_2$ or C_1–C_6 alkoxy, OCH_3, C_1–C_4 alkyl substituted with OCH_3, OC_2H_5, CN or 1 to 3 atoms of F, Cl or Br, C_3–C_4 alkenyl, $CH_2C{=}CR_{13}$ where R_{13} is H, CH_3 or CH_2Cl, —A—$(CH_2)_{n'}$—A_1—(C_1–C_3 alkyl) where A is 0 or S and A_1 is 0, S or SO_2 and n' is as previously defined, SCN, N_3, $NR_{16}R_{17}$ where R_{16} is H or CH_3 and R_{17} is H, OCH_3, C_1–C_6 alkyl, C_1–C_4 alkyl substituted with CN, C_3–C_4 alkenyl, C_3–C_6 cycloalkyl or C_2–C_3 alkyl substituted with OCH_3 or OC_2H_5, or R_{16} and R_{17} can be taken together to form —$CH_2CH_2CH_2CH_2$— or —$CH_2CH_2OCH_2CH_2$—, OR_{14} where R_{14} is C_1–C_4 alkyl substituted with cyano, C_3–C_4 alkenyl or $CH_2C\sigma$— CR_{13} where R_{13} is as previously defined,

or SR_{15} where R_{15} is C_1–C_4 alkyl; with the provision that when Y is ≧4 carbon atoms, R is ≦4 carbon atoms; when X is Cl, then Y is Cl; and when X and Y are both H, then R is ≦4 carbon atoms; and
Z is N or CH.

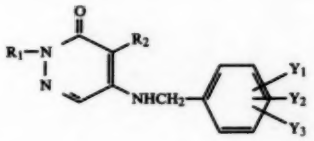
4,892,947

3(2H)PYRIDAZINONE, PROCESS FOR ITS PREPARATION AND ANTI-ALLERGIC AGENT CONTAINING IT

Motoo Mutsukado, Sakura; Keizo Tanikawa, Tokyo; Ken-ichi Shikada, Kuki, and Ryozo Sakoda, Kashiwa, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 22, 1986, Ser. No. 854,521
Claims priority, application Japan, Apr. 27, 1985, 60-91612
Int. Cl.[4] C07D *237/22*; A61K *31/50*
U.S. Cl. 514—247 **29 Claims**

1. A 3(2H)pyridazinone of the formula:



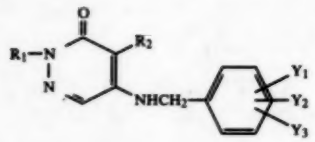
wherein
R_1 is hydrogen; methyl; C_3–C_6 alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; —$(CH_2)_mCO_2R_3$, wherein $R_3$is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; —$(CH_2)_nA$, wherein A is —OH or —$N(R_4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or —CH_2CF_3;
R_2 is chlorine or bromine;
each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; —OR_5, wherein R_5 is hydrogen, C_1–C_8 alkyl or —$(CH_2)_{q'}$-phenyl,

wherein q is an integer of from 1 to 4; —CO_2R_6, wherein R_6 is hydrogen or C_1–C_5 alkyl; —$N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or —SR_8, wherein R_8 is C_1–C_4 alkyl; and

Y_3 is halogen;

or a pharmaceutically acceptable salt thereof.

2. A 3(2H)pyridazinone of the formula:



wherein

R_1 is hydrogen; methyl; C_3–C_6alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; —$(CH_2)_mCO_2R_3$, wherein R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; —$(CH_2)_nA$, wherein A is —OH or —$N(R_4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or —CH_2CF_3;

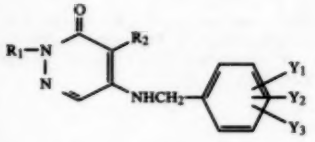
R_2 is chlorine or bromine;

each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; —OR_5, wherein R_5 is hydrogen, C_1–C_8 alkyl or —$(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; —CO_2R_6, wherein R_6 is hydrogen or C_1–C_5 alkyl; —$N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or —SR_8, wherein R_8 is C_1–C_4 alkyl; and

Y_3 is —OR_5, wherein R_5 is as defined above;

or a pharmaceutically acceptable salt thereof.

3. A 3(2H)pyridazinone of the formula:



wherein

R_1 is hydrogen; methyl; C_3–C_6 alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; —$(CH_2)_mCO_2R_3$, wherein R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; —$(CH_2)_nA$, wherein A is —OH or —N(RHD 4)$_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or —CH_2CF_3;

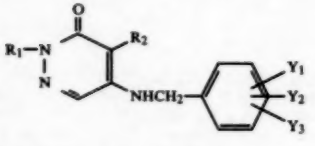
R_2 is chlorine or bromine;

each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; —OR_5, wherein R_5 is hydrogen, C_1–C_8 alkyl or —$(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; —CO_2R_6, wherein R_6 is hydrogen or C_1–C_5 alkyl; —$N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or —SR_8, wherein R_8 is C_1–C_4 alkyl; and

Y_3 is —CO_2R_6, wherein R_6 is as defined above;

or a pharmaceutically acceptable salt thereof.

5. A 3(2H)pyridazinone of the formula:



wherein

R_1 is hydrogen; methyl; C_3–C_6 alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; —$(CH_2)_mCO_2R_3$, wherein R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; —$(CH_2)_nA$, wherein A is —OH or —$N(R_4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or —CH_2CF_3;

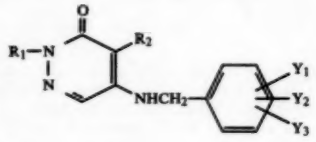
R_2 is chlorine or bromine;

each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; —OR_5, wherein R_5 is hydrogen, C_1–C_8 alkyl or —$(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; —CO_2R_6, wherein R_6 is hydrogen or C_1–C_5 alkyl; —$N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or —SR_8, wherein R_8 is C_1–C_4 alkyl; and

Y_3 is —$N(R_7)_2$, wherein R_7 is as defined above;

or a pharmaceutically acceptable salt thereof.

24. A method of reducing the incidence or severity of allergy induced in a subject by SRS-A, which comprises administering to said subject an amount effective to reduce the incidence or severity of the allergy of a 3(2H)pyridazinone of the formula:



wherein

R_1 is hydrogen; methyl; C_3–C_6 alkeyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; —$(CH_2)_mCO_2R_3$, whererin R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; —$(CH_2)_nA$, wherein A is —OH or —$N(R_4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or —CH_2CF_3;

R_2 is chlorine or bromine;

each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; —OR_5, wherein R_5 is hydrogen, C_1–C_8 alkyl or —$(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; —CO_2R_6, wherein R_6 is hydrogen or C_1–C_5 alkyl; —$N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or —SR_8, wherein R_8 is C_1–C_4 alkyl; and

Y_3 is C_{1-5} alkyl, C_2–C_8 alkenyl; halogen; —OR_5, wherein R_5 is as defined above; —CO_2R_6, wherein R_6 is as defined above; —$N(R_7)_2$, wherein R_7 is as defined above; or —SR_8, wherein R_8 is as defined above;

or a pharmaceutically acceptable salt thereof, and

a pharmaceutically acceptable carrier.

4,892,948

2-METHYL-4-AMINO-5-AMINOMETHYLPYRIMIDINE CARBONATE, PROCESS FOR PREPARING THE SAME AND METHOD OF PURIFICATION OF 2-METHYL-4-AMINO-5-AMINOMETHYLPYRIMIDINE USING THE SAME

Keigo Nishihira, Ube; Masayoshi Yamashita, Tokyo, and Hiroshi Yoshida, Ube, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Apr. 26, 1988, Ser. No. 186,167

Claims priority, application Japan, May 15, 1987, 62-117062

Int. Cl.[4] **C07D** *239/02*

U.S. Cl. 544—326 **1 Claim**

1. A 2-methyl-4-amino-5-aminomethylpyrimidine carbonate.

4,892,949

STILBENE DERIVATIVES

Masaomi Sasaki, Susono, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 875,510, Jun. 18, 1986, which is a continuation of Ser. No. 488,883, Apr. 26, 1983, abandoned. This application Aug. 9, 1988, Ser. No. 230,320

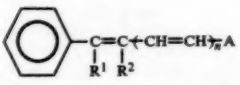
Claims priority, application Japan, Apr. 30, 1982, 57-73075; Apr. 30, 1982, 57-73076; May 14, 1982, 57-80115; May 14, 1982, 57-80116

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[4] C07D *211/08, 211/20, 209/82, 95/08*

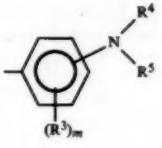
U.S. Cl. 546—98 **13 Claims**

1. A compound having the formula

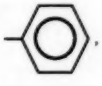


wherein n is 0 or 1, R^2 is hydrogen, alkyl or phenyl; the pair (R^1, A) is selected from the group consisting of

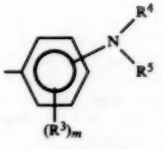
(a) R^1 is hydrogen, A is



(b) R^1 is

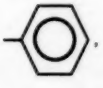


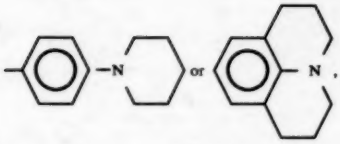
A is selected from the group consisting of



N-alkyl carbazolyl, and substituted N-alkyl carbazolyl, and

(c) R^1 is hydrogen or





wherein R^3 is hydrogen alkyl, alkoxy, or halogen, and R^4 and R^5 independently represent alkyl, aryl, substituted aryl, aralkyl and substituted aralkyl, and m is an integer of from 0 to 2, provided that when R^1 is hydrogen and n is 1, R^2 is not hydrogen.

4,892,950

PROCESS FOR THE PREPARATION OF NAPHTHALENE-1,8-DICARBOXIMIDES

Detlef-Ingo Schütze, Cologne; Klaus Wunderlich, Leverkusen; Karl-Heinz Reinhardt, Leverkusen, and Martin Wienkenhöver, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

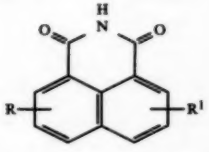
Filed Jun. 9, 1988, Ser. No. 204,468

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719850

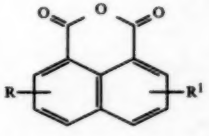
Int. Cl.[4] C07D *221/14*

U.S. Cl. 546—98 **6 Claims**

1. A process for the preparation of a napthalene-1,8-dicarboximide of the formula



in which R and R^1 denotes hydrogen, alkyl, alkoxy, halogen, N,N-dialkylamino and nitro comprising reacting a napthalene-1,8-dicarboxylic anhydride of the formula



with an amonium salt in an aqueous medium at a pH of about 6.5 to 7.5, acidifying the reaction mixture to a pH of 1 to 4 and subsequently adjusting again the pH to a value of about 6.5 to 7.5.

4,892,951

DERIVATIVES OF 3-NITROPYRIDINES USEFUL AS ADJUNCTS TO RADIATION THERAPY

Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 885,513, Jun. 10, 1986, abandoned, which is a continuation of Ser. No. 716,885, Mar. 27, 1985, abandoned. This application Nov. 17, 1988, Ser. No. 273,122

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] C07D *213/76*

U.S. Cl. 546—307 **5 Claims**

1. A method for enhancing the therapeutic effect of radiation

which comprises administering to a patient in need of such radiation treatment an effective amount of a 3-nitropyridine compound of the formula

wherein the $NHCH_2CHOHCH_2OH$ substitutent is attached at position 2, 4 or 6.

4,892,952

SUBSTITUTED HETEROARALKYL, HETEROARALKENYL OR HALOMETHYL FUNGICIDES

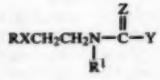
David M. Spatz, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 19, 1982, Ser. No. 443,009

Int. Cl.[4] C07D *253/06, 249/14;* **A01N** *43/707, 43/653*

U.S. Cl. 514—245 **17 Claims**

1. A compound of the formula:



wherein R is phenyl or phenyl substituted with 1 to 4 substituents independently selected from fluoro, chloro, bromo, iodo, lower alkyl and trihalomethyl; R^1 is lower alkyl; Y is $—CH_2W$ where W is a 5- or 6-membered aromatic heterocyclic ring containing 2 or 3 nitrogen atoms and the remainder of the ring atoms carbon atoms; Z is oxygen or sulfur and X is oxygen or sulfur.

11. A method for controlling fungi comprising contacting said fungi or their growth environment with a fungicidally effective amount of a compound of the formula defined in claim 1.

4,892,953

BENZTHIAZOLE SUBSTITUTED DIACID TERPHENYL MONOMERS

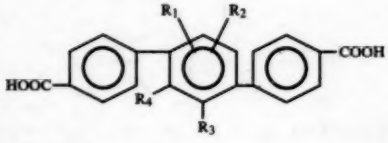
Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 29, 1988, Ser. No. 227,978

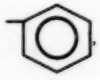
Int. Cl.[4] C07D *277/66*

U.S. Cl. 548—156 **6 Claims**

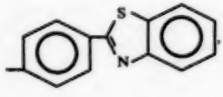
1. A phenylbenzthiazole-substituted p-terphenylene dicarboxylic acid of the formula



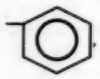
wherein R_1 is —H or



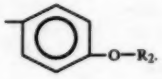
R_2 is



R_3 is



and R_4 is R_2 or



4,892,954

PROCESS FOR THE PREPARATION OF 2-OXO-1,3-DIOXOLANES

Gerhard Brindöpke, Frankfurt am Main, and Manfred Marten, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 894,334, Aug. 8, 1986, abandoned. This application Oct. 21, 1987, Ser. No. 111,979

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529263

Int. Cl.[4] C07D *317/12*

U.S. Cl. 549—229 **9 Claims**

1. A process for the preparation of 2-oxo-1,3-dioxolanes by reaction of epoxides with carbon dioxide in the presence of a catalyst, wherein at least one epoxy compound is mixed with at least one catalyst of the group consisting of 4-dimethyl aminopyridine, 4-(1-pyrrolidinyl)-pyridine, amidines, imidazoles, and is reacted in the presence or absence of an inert solvent at temperatures from 40° to 180° C. while introducing carbon dioxide at normal pressure or slightly increased pressure up to 10 bar to form the corresponding organic carbonates.

4,892,955

METHOD FOR PRODUCING A LACTONE

Keisuke Wada, Yokohama; Yoshinori Hara, Machida, and Koushi Sasaki, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,744

Claims priority, application Japan, Aug. 19, 1986, 61-193691; Apr. 18, 1987, 62-95681

Int. Cl.[4] C07D *307/26*

U.S. Cl. 549—325 **4 Claims**

1. A method for producing a lactone by hydrogenating a dicarboxylic acid, a dicarboxylic acid anhydride and/or a dicarboxylic acid ester in the presence of a catalyst, wherein said catalyst is a ruthenium catalyst substantially free from halogen, comprising (1) ruthenium, (2) an organic phosphine and (3) a conjugate base of an acid having a pKa of less than 2 selected from the group consisting of tetra-fluoroborate anion and hexafluorophosphate anion.

4,892,956

5-CYANO-4,5-DIHYDRO-3,4-DICARBOXYPYRAZOLE DERIVATIVES

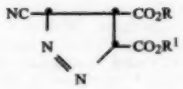
John R. Rizzo, and Eddie V. P. Tao, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 7, 1988, Ser. No. 267,905

Int. Cl.[4] C07D *231/06*

U.S. Cl. 548—356 **3 Claims**

1. A 5-cyano-4,5-dihydro-3H-pyrzole-3,4-dicarboxylic acid dialkyl ester of the formula



wherein R and R^1 are independently C_1–C_{10} alkyl.

4,892,957

PROCESS FOR THE PREPARATION OF A N-ALKYLATED BIPYRAZOLEANTHRONE

Rainer Hildebrand, Lörach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

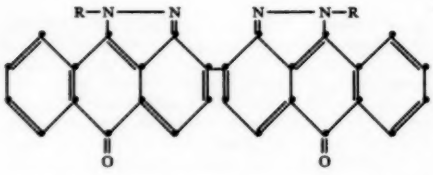
Filed Aug. 15, 1988, Ser. No. 232,043

Claims priority, application Switzerland, Aug. 24, 1987, 3230/87

Int. Cl.[4] C07D *231/54*

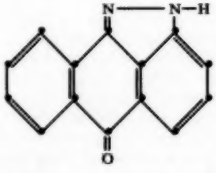
U.S. Cl. 548—357 **9 Claims**

1. A process for the preparation of a N-alkylated 2,2'-bipyrazoleanthrone of formula



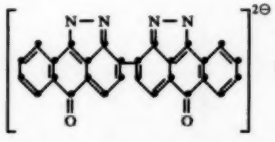
(1)

wherein R is C_1–C_8alkyl, which process comprises dimerising a 1,9-pyrazoleanthrone of formula



(2)

in the presence of an alkali metal hydroxide and an alkanol of 1 to 5 carbon atoms and at elevated temperature, and reacting the resultant intermediate of formula



(3)

wherein Me is an alkali metal cation, with an alkyl halide which introduces the alkyl radical R, in the molar ratio 1:2, and in the presence of an alkylene glycol or a C_1–C_4alkyl ether thereof as catalyst.

4,892,958

PREPARATION OF 5-AMINO-1-PHENYL-4-NITROPYRAZOLES

Hauke Fürstenwerth, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

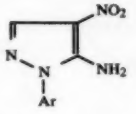
Filed Dec. 8, 1988, Ser. No. 282,225

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742819

Int. Cl.[4] C07D *231/16*

U.S. Cl. 548—362 **10 Claims**

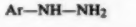
1. A process for the preparation of a 5-amino-1-phenyl4-nitropyrazole of the formula



(I)

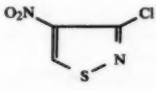
in which

Ar is optionally substituted phenyl, which comprises reacting an arylhydrazine of the formula



(II)

with 3-chloro-4-nitro-isothiazole of the formula



(III)

4,892,959

METHOD FOR THE PRODUCTION OF N-METHYLPYRROLIDINE

Donald H. Champion, Pflugerville; John F. Knifton, and Wei-Yang Su, both of Austin, all of Tex., assignors to Texaco Chemical Co., White Plains, N.Y.

Filed Apr. 22, 1988, Ser. No. 184,660

Int. Cl.[4] C07D *295/02*

U.S. Cl. 548—579 **7 Claims**

1. A method for the production of N-methylpyrrolidine which comprises the steps of reacting N-methylpyrrolidone with hydrogen, and wherein water is a by-product, over a catalyst consisting of copper chromite wherein the copper chromite catalyst comprises 40 to 65% copper oxide and 35 to 60% chromium oxide having a promoter from the group consisting oxides of barium, magnesium and manganese, at a temperature range of 150°–350° C. and a pressure of 1000 psig to 5000 psig, and thereafter isolating the N-methylpyrrolidine from its aqueous azeotrope by extracting said N-methylpyrrolidine with a hydrocarbon selected from the group consisting of pentane, isooctane, xylene, toluene, diethyl benzene and triisopropyl benzene.

4,892,960

CRYSTALLINE LYSOCELLIN COMPOSITIONS AND METHOD OF MAKING

Vernon V. Young, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Northbrook, Ill.

Continuation of Ser. No. 695,419, Jan. 28, 1985, abandoned, which is a continuation of Ser. No. 291,133, Aug. 7, 1981, abandoned. This application Dec. 20, 1985, Ser. No. 810,910

Int. Cl.[4] C07D *309/10*

U.S. Cl. 549—414 **5 Claims**

1. A crystalline lysocellin composition selected from the group consisting of the crystalline free acid of lysocellin, crys-

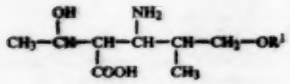
talline zinc lysocellin, crystalline manganese lysocellin and crystalline copper lysocellin.

4,892,961
AMINO ACID DERIVATIVES, AND THEIR PRODUCTION

Shiro Terashima, Tokyo; Yoshikazu Ehmura; Yuzuko Ita, both of Sagamihara; Kunikazu Sakai, Tokyo, and Tsunejiro Hiyama, Sagamihara, all of Japan, assignors to Sankyo Pharmaceuticals Company, Limited, Osaka, Japan

Filed Jul. 28, 1986, Ser. No. 889,889
Claims priority, application Japan, Jul. 31, 1985, 60-167809; Nov. 15, 1985, 60-257340
Int. Cl.[4] C07D 315/00; C07F 7/10
U.S. Cl. 549—429 7 Claims

1. An amino acid compound of the formula:



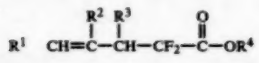
wherein R^1 is a protective group.

4,892,962
PROCESS FOR THE PREPARATION OF 2,2-DIFLUOROPENT-4-ENOIC ACIDS AND ACID DERIVATIVES

Robert W. Lang, Prattein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

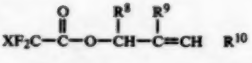
Filed Dec. 7, 1987, Ser. No. 129,198
Claims priority, application Switzerland, Dec. 18, 1986, 5058/86
Int. Cl.[4] C07F 7/10
U.S. Cl. 556—416 6 Claims

1. A process for the preparation of a compound of formula I



(I)

in which signifies cis/trans isomers, R^1 is H, unsubstituted C_1–C_{24}-alkyl or C_6–C_{12}-aryl, C_7–C_{16}-aralkyl or C_8–C_{40}-alkaralkyl which are unsubstituted or substituted in the aryl group by C_1–C_6-alkoxy, C_1–C_6-alkylthio, F, Cl, Br or —CN, R^2 and R^3 independently of one another are H or C_1–C_{24}-alkyl, or R^1 and R^3 together are unsubstituted or C_1–C_6-alkyl-substituted C_1–C_5-alkylene or C_2–C_5-alkenylene, or R^2 and R^3 together or R^1 and R^2 together are unsubstituted or C_1–C_6-alkyl-substituted C_1–C_6-alkylene or C_3–C_6-alkenylene, and R^4 is $SiR^5R^6R^7$, in which R^5, R^6 and R^7 independently of one another are C_1–C_{12}-alkyl, phenyl or benzyl which comprises heating 1 mol of an allyl monobromo- or monochloro-difluoroacetate of the formula II



(II)

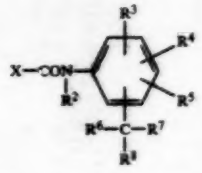
in which is as defined above, X is Cl or Br, R^8 is as defined for R^1, R^9 is as defined for R^2, R^{10} is as defined for R^3, R^8 and R^9 are as defined for R^1 and R^2, R^8 and R^{10} are as defined for R^1 and R^3, R^9 and R^{10} are as defined for R^2 and R^3, in the presence of at least 1 mol of zinc and of at least 1 mol of a monochlorosilane $R^5R^6R^7SiCl$, in which R^5, R^6 and R^7 are as defined above and isolating the compound of formula I.

4,892,963
N-PHENYL AMIDE COMPOUNDS

Peter T. Gallagher, Camberley; Terence A. Hicks, Fleet, and Graham W. Mullier, Aldershot, all of Great Britain, assignors to Lilly Industries Limited, Basingstoke, England

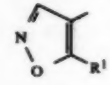
Filed Aug. 7, 1987, Ser. No. 83,538
Claims priority, application United Kingdom, Aug. 8, 1986, 8619432
Int. Cl.[4] A61K 31/165, 31/42, 31/275
U.S. Cl. 558—414 9 Claims

1. A compound of the formula



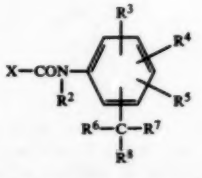
(I)

in which X is $R^1(HO)C{=}C(CN)$—, $R^1(CO)$—$CH(CN)$— or



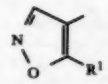
R^1 and R^2 are each hydrogen or C_{1-6} alkyl, R^3, R^4 and R^5 are each hydrogen, hydroxy, halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio, C_{2-5} alkoxycarbonyl, phenyl, phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-suybstituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, phenoxy, phenoxy substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, R′R″N— where R′ and R″ are each hydrogen or C_{1-4} alkyl or R‴CONH— where R‴ is C_{1-4} alkyl, R^6, R^7 and R^8 are each C_{1-6} alkyl, halo-substituted C_{1-6} alkyl, phenyl, or phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, or R^6 and R^7, together with the carbon atom to which they are attached, form a cycloalkyl group containing 3 to 7 carbon atoms, or R^6, R^7 and R^8 together with the carbon atom to which they are attached, form a bicycloalkyl group containing 4 to 9 carbon atoms; and salts thereof.

8. A pharmaceutical formulation comprising a compound of the formula



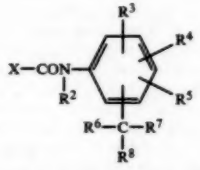
(I)

in which X is $R^1(HO)C{=}C(CN)$—, $R^1(CO)$—$CH(CN)$— or



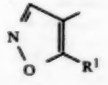
R^1 and R^2 are each hydrogen or C_{1-6} alkyl, R^3, R^4 and R^5 are each hydrogen, hydroxy, halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio, C_{2-5} alkoxycarbonyl, phenyl, phenyl substituted with 1 to 3 groups selected from halogen nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, phenoxy, phenoxy substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, R'R"N— where R' and R" are each hydrogen or C_{1-4} alkyl or R'"CONH— where R'" is C_{1-4} alkyl, R^6, R^7 and R^8 are each C_{1-6} alkyl, halo-substituted C_{1-6} alkyl, phenyl, or phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, or R^6 and R^7, together with the carbon atom to which they are attached, form a cycloalkyl group containing 3 to 7 carbon atoms, or R^6, R^7 and R^8 together with the carbon atom to which they are attached, form a bicycloalkyl group containing 4 to 9 carbon atoms, or a pharmaceutically-acceptable salt thereof, in association with a pharmaceutically-acceptable carrier or diluent therefor.

9. A method of treating an animal, including a human, suffering from or susceptible to a disorder of the immune system or a disease in which leukotrienes are implicated, which comprises administering an effective amount of a compound of the formula



(I)

in which X is $R^1(HO)C{=}C(CN)$—, $R^1(CO)$—CH(CN)— or



R^1 and R^2 are each hydrogen or C_{1-6} alkyl, R^3, R^4 and R^5 are each hydrogen, hydroxy, halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio, C_{2-5} alkoxycarbonyl, phenyl, phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, phenoxy, phenoxy substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, R'R"N— where R' and R" are each hydrogen or C_{1-4} alkyl or R'"CONH— where R'" is C_{1-4} alkyl, R^6, R^7 and R^8 are each C_{1-6} alkyl, halo-substituted C_{1-6} alkyl, phenyl, or phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, or R^6 and R^7, together with the carbon atom to which they are attached, form a cycloalkyl group containing 3 to 7 carbon atoms, or R^6, R^7 and R^8 together with the carbon atom to which they are attached, form a bicycloalkyl group containing 4 to 9 carbon atoms, or a pharmaceutically-acceptable salt thereof.

4,892,964

HYDRAZIDE-CONTAINING THERMOPLASTIC POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

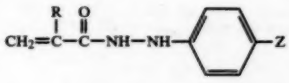
Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 93,680, Sep. 8, 1987, Pat. No. 4,818,802. This application Jun. 22, 1988, Ser. No. 209,985

Int. Cl.[4] C07C *109/04*

U.S. Cl. 558—414 **5 Claims**

1. A polymerizable compound corresponding to the formula:



where R is a substituent selected from hydrogen and C_1–C_4 alkyl groups, and Z is p-cyano or p-trifluoromethyl.

4,892,965

PRODUCING BIS (ALICYCLIC) THIOETHERS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 917,773, Oct. 10, 1986, Pat. No. 4,798,900. This application Jun. 6, 1988, Ser. No. 202,521

Int. Cl.[4] C07C *149/26*

U.S. Cl. 560—118 **2 Claims**

1. 4,4'-Thiobis(3,6-dihydrophthalic acid) and the dimethyl ester thereof.

4,892,966

ACETOACETIC ACID ESTER DERIVATIVES FOR THE MANUFACTURE OF α-HYDROXYCARBONYL COMPOUNDS

Hans J. Wild, Wolfhausen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

PCT No. PCT/CH86/00157, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/03287, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 13, 1986, Ser. No. 86,130

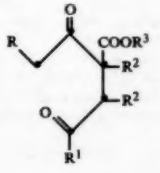
Claims priority, application Switzerland, Nov. 20, 1985, 4942/85; Sep. 23, 1986, 3805/86

Int. Cl.[4] C07C *69/716*

U.S. Cl. 560—174 **8 Claims**

1.

A compound of the formula



II

wherein:

R represents C_{1-4}-alkoxy, chlorine, bromine or C_{1-4}-alkanoyloxy, R^1 signifies C_{1-5}-alkyl, the radicals R^2 each independently represent hydrogen or C_{1-5}-alkyl, and R^3 signifies C_{1-4}-alkyl.

4,892,967

CITRATE ESTERS

Ezekiel H. Hull, Greensboro, and Edward P. Frappier, Kernersville, both of N.C., assignors to Morflex Chemical Company, Inc., Greensboro, N.C.

Division of Ser. No. 117,080, Nov. 4, 1987, Pat. No. 4,789,700, which is a continuation of Ser. No. 865,874, May 21, 1986, Pat. No. 4,711,922, which is a continuation of Ser. No. 735,149, May 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,583, Jun. 11, 1984, abandoned. This application Jul. 11, 1988, Ser. No. 217,217

Int. Cl.[4] C07C *69/704*

U.S. Cl. 560—180 18 Claims

1. A citrate ester selected from the group consisting of acetyltri-n-hexyl citrate and n-butyryltri-n-hexyl citrate, said ester having an aconitate level of less than 0.20% when the esterification mixture from which said citrate is produced tests about 0.6% maximum acidity calculated as citric acid, said ester having heat stability characteristics, after heating at 150° C. for two hours, of a color not greater than 50–60 APHA and a mild odor at 25° C.

4,892,968

3,3'-DICHLORO-4,4-DIAMINODIPHENYL SULFONIC ACIDS

Colin D. Campbell, Beith, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 29, 1988, Ser. No. 226,008

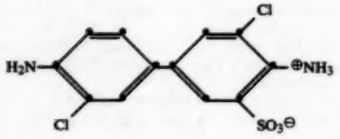
Claims priority, application United Kingdom, Aug. 7, 1987, 8718798

Int. Cl.[4] C07C *143/56*

U.S. Cl. 562—59 1 Claim

1. A compound having the formula I or II

(I)



(II)

or its salt or hydrate thereof.

4,892,969

PROCESS FOR THE PREPARATION OF 1-AMINO-2-NAPHTHOL-4-SULFONIC ACID

Bruno Förtsch, Ramlinsburg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 39,827, Apr. 15, 1987, abandoned, which is a continuation of Ser. No. 823,211, Jan. 28, 1986, abandoned. This application May 31, 1988, Ser. No. 203,553

Claims priority, application Switzerland, Feb. 15, 1985, 731/85

Int. Cl.[4] C07C *143/66*

U.S. Cl. 562—70 5 Claims

1. In a process for the preparation of 1-amino-2-naphthol-4-sulfonic acid by treating 1 mole of 1-hydroxyl-imino-2-tetralone-4-sulfonic acid with an alkali metal pyrosulfite in a mineral acid medium in the presence of catalytic amounts of a copper compound, the improvement which comprises gradually adding said 1-hydroxylimino-2-tetralone-4-sulfonic acid as an aqueous solution over about 2 hours to said acid medium containing 0.5 to 50 millimoles of said copper compound at temperatures in the range of 45° to 50° C., at normal atmospheric pressure, with the exclusion of atmospheric oxygen, and maintaining said temperature range for a reaction time of about one-half hour to two hours.

4,892,970

STAGED AROMATICS OXIDATION IN AQUEOUS SYSTEMS

Neal R. Nowicki, Naperville, and James D. Lowry, Jr., Bolingbrook, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 30, 1985, Ser. No. 814,510

Int. Cl.[4] C07C *51/265, 57/34*

U.S. Cl. 22—413 22 Claims

1. A continuous, staged process for the oxidation of benzenes disubstituted with oxidizable substituents selected from the class consisting of alkyl, hydroxyalkyl, aldehyde, carboalkyl groups and mixtures thereof, to their corresponding acid derivatives in an aqueous solvent system, comprising the steps of:

(a) affording a feed mixture comprising 100 weight parts of the aforesaid disubstituted benzenes, from about 5 to about 100 weight parts of water, from about 0.1 to about 5.0 weight parts of ionic catalytic metals, comprising manganese and at least one other catalytic metal selected from the class consisting of cobalt, nickel, zirconium and mixtures thereof, and bromine in an amount within the range from about 10 to about 300 atom percent, based on total catalytic metals;

(b) partially oxidizing said feed mixture in a first oxidation stage, in the presence of an oxygen-containing gas, at a temperature within the range from about 300° to about 410° F. and at a pressure sufficiently high to maintain the mixture substantially in the liquid phase;

(c) recovering from said first oxidation stage an effluent phase, wherein the degree of conversion to acid derivatives is within the range from about 60% to about 95%.

(d) adding to said effluent phase supplemental bromine to raise the concentration therein of total bromine to a concentration that is higher than the bromine concentration in the first oxidation stage and that is in the range of from about 50 to about 500 atom percent, based on total catalytic metals, and supplemental water in an amount to provide a workable slurry phase;

(e) substantially completely oxidizing the resulting slurry phase in a second oxidation stage, in the presence of an oxygen-containing gas, at a temperature within the range from about 400° to about 480° F. and at a pressure sufficiently high to maintain the slurry substantially in the liquid phase; and

(f) recovering from said second oxidation stage an acid derivative product.

4,892,971

PROCESS FOR THE PREPARATION OF N-ACETYLPHENYLALANINE

Heinz Erpenbach, Cologne; Klaus Gehrmann, and Peter Hörstermann, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 257,715

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 37368613

Int. Cl.[4] C07C *99/06*

U.S. Cl. 562—450 3 Claims

1. A process for the preparation of N-acetylphenylalanine

from 2-methyl-4-benzylidene-1,3-oxazolin-5-one, which process comprises:

opening the ring of the 2-methyl-4-benzylidene-1,3-oxazolin-5-one with a ring-opening agent consisting essentially of water in a solvent medium which is a mixture consisting essentially of said water and an aliphatic C_3-ketone to C_{10}-ketone or a water-miscible ether, thereby obtaining 2-acetaminocinnamic acid in said solvent medium,

hydrogenating the resulting 2-acetaminocinnamic acid in said solvent medium at a temperature in the range of 10° to 50° C. and at a pressure of 1 to 15 bar in the presence of a supported palladium catalyst, thereby obtaining the N-acetylphenylalanine.

4,892,972

PURIFICATION OF CRUDE TEREPHTHALIC ACID

Hobe Schroeder, Warrenville, and David E. James, Batavia, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 905,766, Sep. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 785,322, Oct. 7, 1985, abandoned. This application Apr. 27, 1989, Ser. No. 344,657

Int. Cl.[4] C07C *51/42*; B01J *21/18*

U.S. Cl. 562—487 **30 Claims**

1. A method for the purification of crude terephthalic acid, comprising:

passing an aqueous solution of said crude terephthalic acid, at a temperature of from about 100° C. to about 350° C. and at a pressure sufficient to maintain the solution substantially in the liquid phase, through a particulate catalyst bed and in the presence of hydrogen; said particulate catalyst bed being a layered bed that includes a first catalyst layer supported on an active carbon carrier and containing a metal of Group VIII of the Periodic Table of Elements having a single electron in its outermost orbital when in the ground state, and a lower catalyst layer containing palladium supported on an active carbon carrier; said solution being first passed through said first layer and thereafter being passed through said second layer; and

thereafter cooling the hydrogenated aqueous solution to effect separation of the resulting purified terephthalic acid from said solution by crystallization.

11. A layered catalyst bed suitable for hydrogenation of a relatively impure aqueous solution of crude terephthalic acid containing 4-carboxybenzaldehyde which comprises:

a first catalyst layer constituted by a particulate active carbon carrier containing a metal of Group VIII of the Periodic Table of Elements having a single electron in its outermost orbital when in the ground state; and

a second catalyst layer constituted by a particulate active carbon carrier containing palladium.

4,892,973

PROCESS FOR PRODUCING 1,1-DIPHENYLALKENES

Kozo Mizuno, Uji; Hideaki Fujisaki, Kyoto; Yoshinori Uda, Kyoto; Tadashi Imai, Kyoto, and Katsuhiko Tsunemitsu, Kyoto, all of Japan, assignors to Yamada Chemical Co., Ltd., Kyoto, Japan

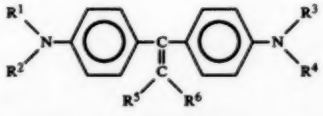
Continuation of Ser. No. 785,500, Oct. 8, 1985, abandoned. This application Aug. 31, 1988, Ser. No. 239,072

Claims priority, application Japan, Oct. 12, 1984, 59-214982

Int. Cl.[4] C07C *87/14*; C07D *209/00, 207/00*

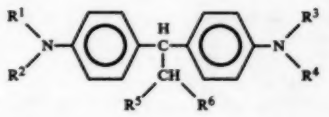
U.S. Cl. 564—315 **5 Claims**

1. A process for producing a 1,1-diphenylalkene represented by the formula:



which comprises dissolving a 1,1-diphenylalkane in an aqueous solvent by adding thereto 2 to 20 mol of an acid based on 1 mol of the 1,1-diphenylalkane and contacting lead peroxide with the 1,1-diphenylalkane in the thus obtained aqueous acidic solution at a temperature of −30° to 30° C., wherein the molar ratio of the lead peroxide to the 1,1-diphenylalkane is 1 to 3:

the 1,1-diphenylalkane being represented by the formula:



wherein R^1, R^2, R^3 and R^4 each independently represent an (C_1–C_6) alkyl group, a (C_3–C_{12}) cycloalkyl group, an aryl (C_1–C_6) alkyl group, or an alkylene group which forms a heterocyclic ring comprising the nitrogen atom to which it is bound and the carbon atom at the ortho-position of the benzene ring bound to the nitrogen atom, or R^1 and R^2 are bound to one another and form a heterocyclic ring comprising the nitrogen atom to which they are bound, or R^3 and R^4 are bound to one another and form a heterocyclic ring comprising the nitrogen atom to which they are bound; and

wherein R^5 and R^6 each independently represent a hydrogen atom, an (C_1–C_{10}) alkyl group, a (C_3–C_{12}) cycloalkyl-group, or an aryl or substituted aryl (C_1–C_6) alkyl group.

4,892,974

PROCESS FOR PRODUCING MONO-ORTHO-TERT-BUTYL-ANILINE USING SILICA-ALUMINA CATALYSTS

William F. Burgoyne, Jr., Emmaus, Pa., and Dale D. Dixon, Venice, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 10, 1988, Ser. No. 166,288

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[4] C07C *85/24*

U.S. Cl. 564—409 **4 Claims**

1. In a process for reacting aniline with isobutylene to form a ring alkylated aniline, said reaction being carried out in the presence of an acidic catalyst, the improvement for selectivity forming monotertiary butyl aniline where the tert butyl group is ortho to the amine at high conversion which comprises:

reacting aniline with isobutylene; and

effecting said reaction in the presence of a silica-alumina catalyst maintained in a fixed bed catalytic reactor;

maintaining a mole ratio of aniline to isobutylene of from 2 to 10, a temperature from 130° to 190° C; and

maintaining an LHSV of from 0.05 to 0.5 hr^{-1}.

4,892,975

DIETHYNYL MONOMERS AND POLYMERS THEREOF

Thomas X. Neenan, Arlington, and George M. Whitesides, Newton, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

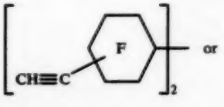
Filed Sep. 28, 1987, Ser. No. 101,632

Int. Cl.[4] C07C *149/34, 43/29, 25/28*

U.S. Cl. 568—56 **2 Claims**

1. The compound 1,3-diethynyl tetrafluorobenzene.

2. A compound having the structure



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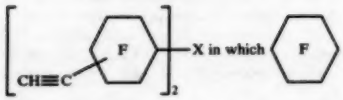


represents a perfluorinated benzene ring and X represents oxygen or sulfur.

4,892,976

PROCESS FOR THE PREPARATION OF ALDEHYDES

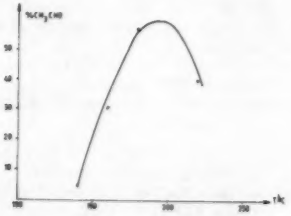
Jean Cordier, Saint Saulve; Bernard Dussart, Schiltigheim; Francis Petit; Yves Castanet, both of Villeneuve D'Aso; Serge Melloul, Lille, and André Mortreux, Hem, all of France, assignors to Sollac, Paris, France

Filed Jul. 15, 1988, Ser. No. 219,926

Claims priority, application France, Jul. 16, 1987, 87 10044

Int. Cl.[4] C07C *45/49*

U.S. Cl. 568—465 **12 Claims**



1. A process for the selective preparation of an aldehyde of the formula

R—CHO

in which R is a C_1–C_7 alkyl, the process comprising reacting an alkyl formate of the formula

H—COOR

in which R has the meaning given above, with CO in the absence of H_2, in the presence of:

(a) a catalyst based on a metal selected from Rh, Ru, Ir, mixtures of them and a mixture of RH and/or Ru and/or Ir with Co, Ni or Fe, said catalyst being used in a molar proportion of between 10^{-2} and 10^{-4} with respect to the alkyl formate;

(b) a promoter selected from the iodides of alkali and alkaline earth metals, quaternary ammonium iodides and phosphonium iodides, mixtures of covalent compounds of iodine and a phosphine of formula PR'$_3$, R' being selected from alkyl and aryl, and mixtures of covalent compounds of iodine and a tertiary amine of formula NR''$_3$, R'' being alkyl, the iodide or the covalent compound of iodine being used in a molar proportion of $4{\cdot}10^{-2}$ to $0.25{\cdot}10^{-2}$ with respect to the alkyl formate; and,

(c) a solvent consisting of a cyclic N—(C_1–C_6 alkyl) amide, the cyclic amide being used in a molar proportion of at least 1 with respect to the alkyl formate whereby the cyclic N—(C_1–C_6 alkyl) amide aids in providing good selectivity of the R—CHO.

4,892,977

PREPARATION OF NONIONIC SURFACTANTS BY OXYALKYLATION WITH A MAGNESIUM CATALYST

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Jun. 13, 1988, Ser. No. 205,754

Int. Cl.[4] C07C *41/03*

U.S. Cl. 568—618 **12 Claims**

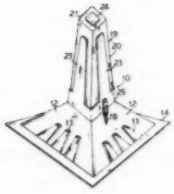
1. A method for the alkoxylation of a reactive hydrogen compound selected from the group comprising monohydric alcohols having between about 6 and about 30 carbon atoms, both branched and linear, with an alkylene oxide having 2 to 4 carbon atoms comprising reacting said monohydric alcohol with said alkylene oxide at a temperature at which the reaction proceeds in the presence of at least a catalytic amount of a catalyst that is produced by (a) mixing a high molecular weight alcohol with magnesium and a low molecular weight alcohol and subsequently removing the low molecular weight alcohol then (b) reacting the resulting magnesium-containing compound with phosphorus acids or esters.

4,892,978

SELF-SUPPORTING PEDESTAL

William Axworthy, P.O. Box 2628, Station "B" , Richmond Hill, Ontario, Canada L4E 1A6

Filed Mar. 10, 1989, Ser. No. 321,711
Int. Cl.[4] H02G *9/02*
U.S. Cl. 174—38 **5 Claims**



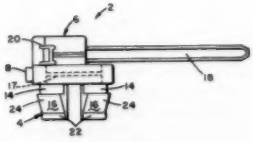
1. A self-supporting pedestal comprising,
a hollow generally truncated pyramidal base unit having a square base and slanting side walls sloping upwardly to a square upper end,
a square collar extending upwardly from said upper end and having two pairs of mutually parallel upstanding side walls,
two channels formed in two opposite upstanding side walls of said square collar,
horizontal flanges extending outwardly from said square base of said base unit,
an inverted U-shaped bracket means having two lower leg members therein slidably and movably engageable with said channels in said upstanding side walls of said square collar,
a top cover means operative to dispose over said base unit, said top cover means having a hollow truncated generally elongated pyramidal shape with slanting side walls sloping convergently upwardly to a closed square top panel and divergently downwardly to a square open bottom end.

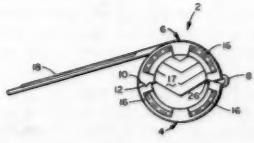
4,892,979

MULTI-PIECE INSULATING BUSHING AND METHOD OF SECURING AN ELECTRICAL CONDUCTOR THERETO

Leroy J. Rossow, 11050 50th St. North, Lake Elmo, Minn. 55042

Filed Jun. 7, 1988, Ser. No. 203,083
Int. Cl.[4] H01B *17/26*
U.S. Cl. 174—153 G **19 Claims**





1. A bushing comprising a tubular body member having a lengthwise coextensive bore for receiving elongated through members, a bulkhead fastener portion and a through member fastener portion, wherein said through member fastener portion is defined by an arcuate portion of said body member mountable exteriorly of a bulkhead and includes:
(a) a collar having a through aperture;
(b) an elongated wrap member positioned to circumscribe through members when positioned in said bore and to mount in said collar;
(c) means for restraining said wrap member when cinched about said through members; and
(d) a wedging member transversely extending from an interior wall of the bore of said body member.

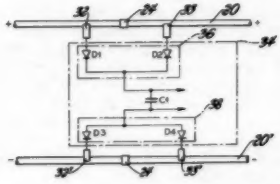
19. A method for securing an electrical conductor to a multi-piece bushing comprising the steps of:
(a) mounting at least one electrical conductor in a longitudinal bore of a tubular bushing member comprised of a plurality of portions which portions align with one another to define said bore;
(b) passing a wrap member about said conductor and relative to a first latch means to secure said conductor to at least one of said portions; and
(c) passing a remaining end of said wrap member about an outer surface of said bushing member and relative to a second latch means to secure the portions of said bushing member to one another.

4,892,980

DUAL CONTACTS ON VOLTAGE RAIL

Ron Riley, Grand Blanc, Mich., assignor to J. N. Fauver Company, Madison Heights, Mich.

Filed Aug. 3, 1988, Ser. No. 227,704
Int. Cl.[4] B60L *5/04, 5/38*
U.S. Cl. 191—14 **36 Claims**



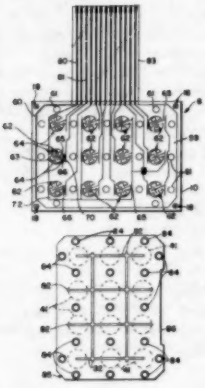
35. A conveyor assembly including a vehicle (12) for moving about a track (18), said assembly comprising; vehicle (12) being mobile along the track (18), conductive means (20) along the track (18) for supplying an electrical signal to said vehicle (12), said conductive means (20) along the track (18) for supplying an electrical signal to said vehicle (12), said conductive means (20) comprising isolated sections of rail each transmitting an electrical signal and having buffers (24) between each isolated section for preventing electrical conduction therebetween, and said vehicle (12) including at least two contacting pads (32, 33) placed a distance apart and in contact with said conductive means such that at least one contacting pad is in electrical connection with said rail and including receiver means (34) connected to said contacting pads (32, 33) for receiving the electrical signal from each contact pad (32, 33) and for preventing back feeding of received electrical signals to either contact pad (32, 33), said receiver means (34) including diode logic for receiving said electrical signals on one of said contacting pads (32, 33) and for preventing backfeeding to the other of said contacting pads.

4,892,981

SNAP-IN MODULAR KEYPAD APPARATUS

Richard Soloway, 2 Richard Rd., Lido Beach, N.Y. 11566, and Richard Farrell, 84 Claire Ct., West Babylon, N.Y. 11704

Filed Sep. 26, 1988, Ser. No. 248,824
Int. Cl.[4] H01H *13/70*
U.S. Cl. 200—5 A **19 Claims**



1. A keypad apparatus comprising:

a planar frame member having a front surface and a back surface, and including a plurality of button accommodating apertures located on said planar member extending from the front surface to the back surface, and a plurality of mounting post members extending outwardly from said back surface thereof;

a button assembly including a planar elastomeric member having a front surface and a back surface, and a plurality of elastomeric buttons dimensioned to be received by said button accommodating apertures and formed integrally with said elastomeric member extending outwardly from said front surface, said elastomeric member having a plurality of first apertures extending from the front surface to the back surface and being positioned thereon to receive said mounting post members such that each of said buttons extends through an associated button accommodating aperture of said frame, said button assembly being mounted to said frame such that said buttons are depressable, each button having a conductive bottom member located on the bottom thereof;

a switch assembly including a thin planar member fabricated from Mylar having a front surface and a back surface, and a plurality of contact areas located on the front surface of the thin planar member, one contact area corresponding to each button, said contact area having an outer partial circular contact disrupted by an opening and electrically connected to at least four equally-spaced, inwardly disposed triangular sections, and an inner T-shaped contact surrounded by said outer contact, said T-shaped contact having an upper branch and a lower branch, said upper branch being positioned between said triangular sections and said lower branch extending through said opening, said inner T-shaped contact being electrically insulated from said outer partial circular contact, said thin planar member having a plurality of second apertures extending from the front surface to the back surface and being positioned to receive said mounting post members such that said contact areas oppose said corresponding buttons, said switch assembly being mounted on said button assembly such that said corresponding conductive bottom member electrically connects said outer contact to said T-shaped inner contact upon depression of an associated button; and

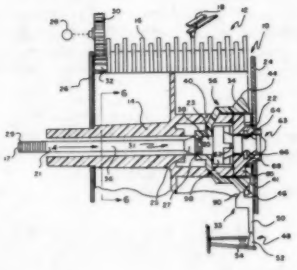
a planar back plate member having a front surface and a back surface and including a plurality of third apertures positioned to receive said mounting post members, the front surface of said back plate being mounted on top of said switch assembly with said mounting post members extending through said third apertures, said mounting post members having their respective ends deformed to form a fixed, secured sandwich-like assembly, said back plate serving as a stop to enable an operator of a button to tactically feel said button operation.

4,892,982

TIMING MECHANISM WITH IMPROVED CLUTCH ASSEMBLY

William J. Hueber, Brownsburg; Robert L. Eder, Speedway, and R. Keith Cearlock, Frankfort, all of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 106,999, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 5,015, Oct. 20, 1987, abandoned, and a continuation-in-part of Ser. No. 124,493, Nov. 23, 1987, abandoned. This application May 2, 1988, Ser. No. 189,326
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 R **12 Claims**



1. A timing mechanism comprising:

a support;

a camstack, a shaft, first clutch teeth and second clutch teeth all mounted in said support for rotation about a common axis, said shaft movable along said axis between a first position and a second position;

first switch means for contacting said camstack to be actuated thereby; means for mechanically coupling said first clutch teeth to said camstack so that when one rotates the other also rotates;

said second clutch teeth integrally formed with said shaft;

said shaft, said first teeth, and said second teeth located so that when said shaft is in said first position, said first teeth are intermeshed with said second teeth and when said shaft is in said second position said first teeth and said second teeth are disengaged; and

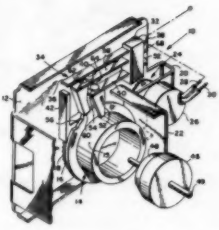
intermesh assurance means for causing said first and second teeth to intermesh when said shaft is moved axially from said second position toward said first position no matter what relative rotational position about said axis said shaft is in.

4,892,983

PROGRAMMER/TIMER WITH COMBINED LINE AND PROGRAM FUNCTION SWITCH

Richard C. Bogda, Elmhurst, and George D. Georgacakis, Skokie, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 8, 1988, Ser. No. 281,572
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 R 7 Claims



1. A combination electrical programmer timer and line switch assembly for an appliance comprising:

(a) housing means;

(b) a program cam mounted for rotary movement on said housing means;

(c) timing motor means associated with said housing means and operable upon energization to effect said movement of said program cam;

(d) a first movable line switch contact blade mounted on said housing means for connection to one side of a power line;

(e) actuator means movably mounted on said housing means and including auxiliary cam means contacting a movable member operable upon user manual movement to move said movable member for moving said movable first contact blade between a first (low) and second (high) position;

(f) a stationary contact blade mounted on said housing means for series connection with certain appliance functions;

(g) an active program switch contact blade disposed on said housing means between said first movable line contact blade and said stationary blade, said program switch blade including a cam follower contacting said program cam, said program switch blade series connected with said motor means for series connection with all of said appliance functions, wherein said line contact blade in said high position prevents energization of said motor for any position of said cam follower on said programmer cam and in said first (low) position, maintains said motor energized for all positions of said cam follower on said program cam.

4,892,984

ROTARY VACUUM-ELECTRICAL CONTROL

James F. Clark, Marshall; David J. McFadyen, Paris, both of Ill., and Pradeep K. Mishra, Terre Haute, Ind., assignors to TRW Inc., Lyndhurst, Ohio

Filed Feb. 8, 1989, Ser. No. 308,242
Int. Cl.[4] H01H *9/06*; F16K *11/06*
U.S. Cl. 200—61.86 24 Claims

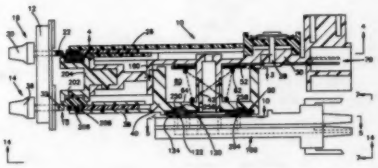
1. A rotary vacuum-electrical switch controller, comprising:

a valve body including a valve seat having a generally flat first circular surface and having a plurality of valve ports therein, a plurality of valve nipples extending from said body and adapted for connection to a vacuum source and vacuum control devices and means for connecting each of said ports with a respective one of said nipples;

a disk-shaped valve plate having an axis of rotation and having a second circular surface facing said first surface and being coaxial therewith and having a plurality of chambers defined therein by peripherally encompassing radially and circumferentially extending walls for selectively interconnecting various of said ports as said valve plate is rotated about said axis of rotation;

a rotor having first and second ends and being coaxially aligned with said valve plate, said first end having means for engaging said valve plate for rotating said valve plate about said axis of rotation;

an electrical switch body including a stator member having a generally flat surface having a plurality of electrical leads mounted thereon;



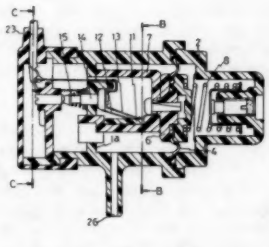
a disk-shaped electrically conductive switch plate interposed between the second end of said rotor and said switch body and being coaxially aligned with said rotor, the second end of said rotor having means for drivingly engaging said switch plate so as to drive said switch plate about said axis of rotation, said switch plate having means for selectively interconnecting various of said electrical leads as it is rotated about said axis of rotation.

4,892,985

VACUUM RESPONSIVE MULTICONTACT SWITCH

Yosuke Tateishi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Jan. 27, 1989, Ser. No. 302,606
Claims priority, application Japan, Jan. 29, 1988, 63-020245
Int. Cl.[4] H01H *35/34*
U.S. Cl. 200—83 N 6 Claims



1. A multicontact vacuum responsive switch comprising:

a housing;

diaphragm means for dividing the interior of said housing into first and second chambers;

means for connecting said first chamber to a vacuum source;

means for communicating said second chamber with atmospheric pressure, whereby said diaphragm means is movable within said housing in response to a pressure differential between said first and second chambers;

a plate in said housing and movable with said diaphragm means, said plate having an electrically conductive portion;

a plurality of electrical contacts mounted in said housing and slidably contacting said plate such that said contacts may selectively contact said electrically conductive portion of said plate in response to said movement of said diaphragm means; and

means for adjusting the position of at least one of said

contacts in the direction of movement of said diaphragm means,

wherein one of said contacts comprises a reference contact which always contacts said conductive portion and wherein said conductive portion is shaped with a pattern such that each of a remainder of said contacts slidably contact said conductive portion at a predetermined vacuum pressure difference between said first and second chambers.

4,892,986

VACUUM CIRCUIT BREAKER

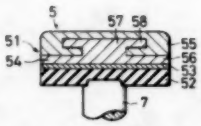
Ruyji Watanabe, Toukai; Seiki Shimizu, and Hisashi Ando, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 732,005, Apr. 29, 1985, abandoned. This application Jan. 12, 1988, Ser. No. 143,119

Claims priority, application Japan, Feb. 9, 1983, 58-160448

Int. Cl.[4] H01H *9/30, 33/00, 1/02, 1/06*

U.S. Cl. 200—144 B **7 Claims**



1. A vacuum circuit breaker comprising:

a vacuum container;

a pair of copper support electrodes axially arranged in and carried by said vacuum container, at least one of said support electrodes being axially movable;

a pair of auxiliary support electrodes, each made of a sintered conductive refractory cobalt body of a theoretical density ratio of more than 95% and having a disk-like base and a protrusion projecting therefrom, said protrusion having a larger diameter portion at an end thereof and a smaller diameter portion between said base and said larger diameter portion, said larger diameter portion being smaller than an outer diameter of said base;

a pair of porous conductive cobalt refractory bodies respectively sintered on said auxiliary support electrodes so as to embed said protrusion, the sintered porous conductive cobalt refractory bodies each having sufficient porosity for impregnation by a molten metal compound and impregnated with a melted metal compound of Ag_2Se which reaches interfaces between said auxiliary support electrodes and said sintered porous cobalt refractory bodies thereby providing a pair of electrical contacts, with each of said contacts providing at one side an auxiliary support electrode portion and at an opposite side of electrical contact portion; said porous refractory body sintered on said auxiliary support electrode having a diameter substantially equal to diameters of said base of said auxiliary support electrode and said support electrode and

solder layers of silver alloy each disposed between and joining one end of said support electrode and said auxiliary support electrode and spreading substantially all over an opposite face of said auxiliary support electrode to said end of said support electrode.

4,892,987

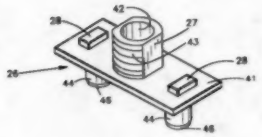
MOUNTING FOR ELECTRICAL CONTROL

Mousa Aframian, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 23, 1989, Ser. No. 299,142

Int. Cl.[4] H01H *9/00*

U.S. Cl. 200—296 **17 Claims**



1. An infinite switch appliance control and adapter combination, said control without said adapter being mountable on a control panel of an appliance with threaded fasteners and with said adapter being mountable on a control panel of an appliance by a bushing mount, said control comprising a body assembly providing a metal mounting surface providing at least one screw receiving opening therein adapted to receive a threaded fastener for mounting said control, said control also providing an operator extending through said mounting surface, a one-piece bushing mount adapter having a tubular bushing portion encircling said operator adjacent to said mounting surface and providing external threads, said adapter also providing a projection extending through said screw opening with an interference fit to secure said adapter on said control against said mounting surface, said adapter being formed of a material which is softer and more ductile than the metal of said mounting surface, permitting said adapter to be mounted on said control by axially inserting said projection into said opening, said opening providing edges biting into the surface of said projection after said projection is inserted therein permanently securing said adapter on said body assembly, said adapter permitting mounting of said control on a control panel with said bushing portion and operator extending therethrough, and a nut received on said bushing portion for securing said control to said control panel.

4,892,988

MEMBRANE PANEL SWITCH

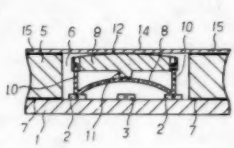
Toshihiro Ishii, Fukuyama, Japan, assignor to Ishii Hyoki Co., Ltd., Japan

Filed Feb. 8, 1988, Ser. No. 153,675

Claims priority, application Japan, Apr. 10, 1987, 62-89311

Int. Cl.[4] H01H *3/12*

U.S. Cl. 200—516 **2 Claims**



1. A membrane panel switch, comprising:

(a) a sheet of extrtuded foam-molded polypropylene having a thickness of greater than 2 mm;

(b) an aperture for a switch in said sheet;

(c) a printed circuit board coupled to said shset and having a pair of contact elements disposed within said aperture;

(d) a clicking plate in said aperture in contact with one of

said contact elements and spaced from the other of said contact elements;

(e) said clicking plate having projections at ends thereof extending to an opening of said aperture from a bottom of said aperture;

(f) a press plate having a spherical upper surface and a lower surface in said aperture, said lower surface contacting said clicking plate;

(g) said press plate further having vertical through holes pierced therethrough said projections of said clicking plate being inserted and guided in said through holes.

4,892,989

DISCHARGE MACHINING APPARATUS HAVING MEANS FOR DISTINGUISHING ABNORMAL INTERELECTRODE GAP CONDITIONS

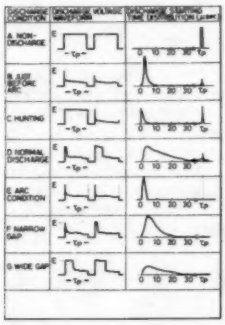
Tetsuroh Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,328

Claims priority, application Japan, May 2, 1983, 58-77731; May 4, 1983, 58-78523; May 4, 1983, 58-78524; May 4, 1983, 58-78525; May 4, 1983, 58-78526; May 4, 1983, 58-78718; May 4, 1983, 58-78719; May 4, 1983, 58-78720; May 4, 1983, 58-78721

Int. Cl.[4] B23H *1/02, 1/10*

U.S. Cl. 219—69.13 **20 Claims**



1. A discharge machining apparatus comprising: an electrode disposed in confronting relation to a workpiece with an insulative machining solution interposed therebetween for machining the workpiece by an electric discharge generated across an interelectrode gap between said electrode and said workpiece; detector means for detecting a distribution of times prior to generation of said discharge across said interelectrode gap after a voltage has been applied thereacross, wherein said voltage comprises a pulsed voltage having a predetermined time duration and applied periodically across said interelectrode gap, said detector means being arranged to divide said time duration of said voltage into a plurality of intervals and count occurrences of discharge started in each of said intervals for a predetermined period of time, such that said distribution of times is detected; and interelectrode condition discriminator means for comparing a distribution of times as detected by said detector means after the voltage has been applied across said interelectrode gap and before the discharge is generated thereacross to produce a signal indicative of a condition of said interelectrode gap.

4,892,990

AUTOMATIC WELDING APPARATUS FOR WELD BUILD-UP AND METHOD OF ACHIEVING WELD BUILD-UP

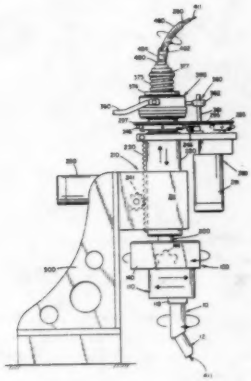
Rees Acheson, Hill Rd., Alstead, N.H. 03602

Continuation-in-part of Ser. No. 945,182, Dec. 23, 1986, Pat. No. 4,687,899, which is a continuation of Ser. No. 707,341, Mar. 1, 1985, abandoned, and a continuation-in-part of Ser. No. 815,682, Jan. 2, 1986, which is a continuation-in-part of Ser. No. 759,543, Jul. 23, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 120,393

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.14 **19 Claims**



1. Apparatus for weld build-up on a surface of revolution, comprising:

an elongated, rotatable assembly that supports, at one end, an electrical welding torch that terminates in a nozzle,

said rotatable assembly being adapted to introduce electrical welding current, inert gas, and welding wire to the torch,

characterized in that

said assembly comprises an electricity conducting, hollow, metal drive spindle (200) consisting of an outer, elongated, hollow tubular body,

said apparatus further comprising,

means for direct application of driving motion (240) to said outer tubular body for rotation of said torch, and means for conducting electrical current (300) into said tubular body of said metal drive spindle for transmission along the electrically live outer body to the torch (10), and

the gas and welding wire pass within said electrical current-carrying, hollow spindle to the torch.

4,892,991

UTILIZATION OF A MATERIAL POSSESSING A MICRO-DUPLEX GRAIN STRUCTURE

Hansjorg Stadler, Ruckersdorf, and Peter Ruchel, Lauf, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Division of Ser. No. 157,330, Feb. 17, 1988. This application Mar. 20, 1989, Ser. No. 325,692

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710334

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.74 **3 Claims**

1. A method of deflecting a laser beam comprising deflecting a laser beam off of a reflective surface formed from a brass material possessing a micro-duplex matrix, or grain structure,

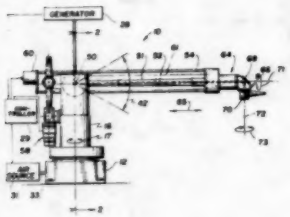
said brass having a theoretical copper content in the range of about 61–65%, the remainder being zinc.

4,892,992

INDUSTRIAL LASER ROBOT SYSTEM

Hadi A. Akeel; Stan H. McClosky, both of Rochester, and Lupcho Najdovski, Sterling Heights, all of Mich., assignors to GMF Robotics Corporation, Auburn Hills, Mich.

Filed Nov. 3, 1988, Ser. No. 266,679
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.78 **37 Claims**



1. An industrial laser robot system comprising:
a laser beam generator for generating a laser beam;
a pedestal having a first axis;
a hollow base supported on said pedestal for rotation about said first axis;
hollow arm support means laterally supported on said base for rotation relative to the base about a second axis, said first and second axes being obliquely angled to and intersecting one another;
a robot arm elongated along a third axis and laterally supported on said arm support means for pivotal rotation therewith relative to the base about said second axis;
a first mirror supported by and within said base to rotate therewith about the first axis so that the reflective surface of said first mirror contains a first point of intersection of said first and second axes and so inclined so that a laser beam traveling along said first axis is deflected by said first mirror to travel along said second axis;
a second mirror supported by said arm support means within said arm to rotate therewith about the second axis so that the reflective surface of said second mirror intersects said second axis at a second point of intersection and is so inclined to direct said laser beam along said third axis of said arm;
an optical focusing assembly mounted on said arm; and
a continuous unobstructed hollow passage that extends along and surrounds said first axis to said first point of intersection and along said second axis to said second point of intersection and along said third axis to and through said optical focusing assembly; said pedestal being so disposed so that the base receives the laser beam from the laser beam generator for transmission along said hollow passage to said optical focusing assembly.

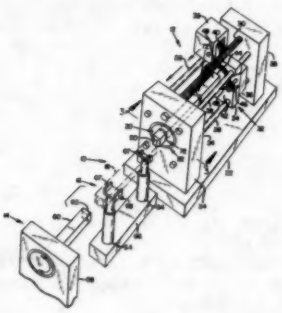
4,892,993

WELDING SYSTEM FOR HOLLOW THIN WALLED MEMBERS

Isreal Stol, Mt Lebanon, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 19, 1988, Ser. No. 196,373
Int. Cl.[4] B23K *9/32*
U.S. Cl. 219—125.1 **32 Claims**

1. A system for facilitating the welding of a thin walled attachment to outside surfaces of a thin walled hollow member at a plurality of welded joints, said member having an elongated cavity defined by a plurality of elongated internal wall surfaces and having at least one open end, comprising:
(a) a mandrel carrier for receiving and supporting an end of a mandrel, the carrier being supported for movement in a longitudinal direction;
(b) means for supporting the hollow member so that its elongated cavity extends in the longitudinal direction;



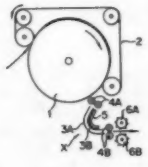
(c) an elongated expandable mandrel supported at one end by the carrier in substantially cantilever fashion and extending in the longitudinal direction and having a free end opposite from the supported end: and
(d) means for advancing the carrier with the mandrel in the longitudinal direction so that the free end of the mandrel passes through the at least one open end and enters the cavity of the thin walled hollow member.

4,892,994

CURLING PREVENTION DEVICE OF THERMAL DEVELOPING MACHINE

Masaru Tsuchiya; Junichi Kohno, and Ken Okauchi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,780
Claims priority, application Japan, Mar. 17, 1987, 62-61785
Int. Cl.[4] H05B *3/00*
U.S. Cl. 219—216 **10 Claims**



1. A device for the prevention of curling in a thermal-developing, light-sensitive material passed through a thermal developing machine having means for subjecting said material to a thermal developing operation which results in curling said material to bend in a certain arc, said device comprising:
a correcting guide passage adapted to be positioned at an outlet of a thermal developing means and to receive material as it exits therefrom, said correcting guide passage having at least a portion thereof bent in an arc opposite to an arc of said material, and
means for controlling the temperature of said material as it enters said correcting guide passage from the outlet of said thermal developing means to be at least 50° C. and lower than a thermal developing temperature of said material.

4,892,995

ELECTRIC PORTABLE DESOLDERING IRON

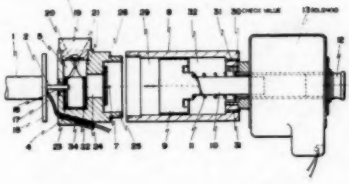
Bienvenido Del Pino Millan, Sector Foresta 24, Tres Cantos, Colmenar Viejo, Madrid, Spain

Continuation-in-part of Ser. No. 116,017, Oct. 30, 1987, abandoned. This application May 17, 1988, Ser. No. 195,137

Claims priority, application Spain, Nov. 4, 1986, 8602897; Oct. 19, 1987, 8702978

Int. Cl.[4] B23K *3/04*

U.S. Cl. 219—230 **20 Claims**



1. An automatic portable desolderer comprising: a tubular heating member, to melt soldering material defining a suction conduit, a housing defining a reservoir for collection of the soldering material, the housing having an opening communicating with said tubular heating member suction conduit; a cylinder connectable to said housing, defining a working space, a passage in said housing providing fluid communication between said reservoir and said cylinder working space relief valve means for blocking fluid flow in the direction from exterior of said cylinder to said cylinder and allowing fluid flow from said cylinder to the exterior of said cylinder; a piston positioned within said cylinder for reciprocal movement therein, said piston having a piston rod formed of a magnetically attractable material; a solenoid coil positioned adjacent said cylinder, said piston rod forming a solenoid core which is pulled to a central position when the coil is energized; a spring member positioned within said cylinder for urging said piston away from said solenoid coil; first one-way valve means positioned between said cylinder and said reservoir for blocking fluid flow in the direction from said cylinder to said reservoir and allowing fluid to flow in the direction from said reservoir to said cylinder; and, second one-way valve connected to said relief valve means preventing fluid from entering said cylinder and allowing fluid to exit said cylinder, when said coil is energized, said piston drawing air through said first one way valve which draws melted soldering material into said reservoir, when said solenoid coil is de-energized, said piston moving toward said reservoir and fluid within said working chamber escaping from said cylinder through said relief valve means, said housing including a reservoir opening and a locking plug sealing said reservoir from the exterior of said housing, said locking plug being removable to remove solder from said reservoir, a solder retaining member being positioned in said reservoir to retain solder as it moves from said suction conduit, said retaining member being removable from said reservoir through said reservoir opening.

4,892,996

THERMOSTATICALLY CONTROLLED IN-LINE DIESEL FUEL HEATER USING A BIMETAL DISC THERMOSTAT

James L. Mertes, Altadena, Calif., assignor to TRW Technar Inc., Irwindale, Calif.

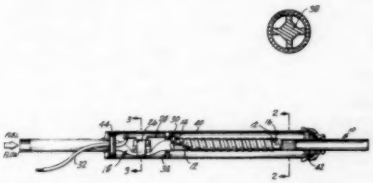
Continuation of Ser. No. 89,227, Aug. 25, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 220,409

Int. Cl.[4] H05B *1/02;* **F24H** *1/10;* **F02M** *31/00;* **H01H** *37/04*

U.S. Cl. 219—301 **6 Claims**

1. A fuel heater for diesel engine fuel line conducting a diesel fluid in which wax precipitates below a predetermined ambient temperature comprising:

a metal pipe section for transporting a fluid, a resistance heater strip in thermal contact with a first portion of the pipe section, a thermostatic switch connected in series with the resistance heater and being mounted on a second portion of the pipe in heat sensing relationship to the pipe, the second portion of the pipe being upstream of the first portion of the pipe in relation to the normal direction of fluid flow through the pipe, the second portion having a pipe wall that is flattened to less than half the normal diameter of the pipe to reduce the cross-sectional area of the pipe, the thermostatic switch having a heat sensitive bimetal disk that snaps over center to open the switch as



the disk is heated and to close the switch as the disk is cooled about a predetermined reference temperature, the disk being mounted to said flattened pipe wall, the thermostatic switch being held below said reference temperature by fluid flowing past the flattened pipe wall at an ambient fluid temperature below the level at which wax forms in the fluid but rising above said reference temperature when the fluid stops flowing and the heater is on because of conductive heat transfer in the pipe between the heater and the switch.

4,892,997

ELECTRIC HEATERS

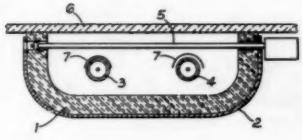
Joseph A. McWilliams, Droitwich, United Kingdom, assignor to Micropore International Limited, Worcestershire, England

Continuation of Ser. No. 742,707, Jun. 7, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 86,227

Claims priority, application United Kingdom, Jun. 9, 1984, 8414764

Int. Cl.[4] H05B *3/74*

U.S. Cl. 219—461 **19 Claims**



1. An electric cooker which comprises:

a smooth cooking surface; and

at least one electric heater mounted beneath said smooth cooking surface and comprising:

a dish;

a layer of thermal insulation material supported in said dish;

at least one source of infra-red radiation in the form of an infra-red lamp supported between said layer of thermal insulation material and said cooking surface;

a thermal cut-out device; and

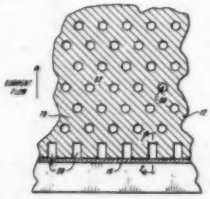
at least one respective reflector positioned to intercept infra-red radiation emitted by each said source in a direction towards said smooth cooking surface, and to reflect said infra-red radiation in a direction towards said layer of thermal insulation material.

4,892,998

SEMI-CONDUCTIVE ELECTRICAL HEATING DEVICE WITH VOIDS

John A. Marstiller, Marston Mills; Paul H. Bodensiek, Waltham, and Frederick G. J. Grise, Osterville, all of Mass., assignors to Flexwatt Corporation, West Wareham, Mass.

Filed Dec. 29, 1987, Ser. No. 138,857
Int. Cl.[4] H05B 3/10
U.S. Cl. 219—548 **26 Claims**



1. An electrical heating device including a layer of semi-conductive material carried on an insulating surface and defining a semi-conductive pattern, and a pair of spaced-apart conductors electrically connected to said semi-conductive pattern, said device being characterized in that

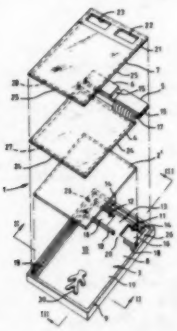
a first heating portion of said semi-conductive pattern intermediate said conductors includes a two-dimensional array of areas devoid of semi-conductive material ("voids") within a mesh of semi-conductive material, said voids being arranged such that the centers of the voids forming sets of three adjacent voids are positioned at the corners of equilateral triangles.

4,892,999

CALCULATOR

Ho Wai-Kwan, Kwai Chung, Hong Kong, assignor to Leona Electronics Co., Ltd., Hong Kong

Filed Jul. 15, 1988, Ser. No. 219,138
Int. Cl.[4] G06C 5/02
U.S. Cl. 235—1 D **20 Claims**



1. A calculator or memory device, comprising:

a printed circuit board for performing memory functions;

a substantially transparent circuit board having a plurality of switches for inputting information to the printed circuit board;

a body external of the transparent circuit board and printed circuit board, the body including a substantially transparent keyboard-supporting member for supporting the transparent circuit board;

at least a portion of the keyboard-supporting member forming a hollow void between the transparent circuit board and the body; and

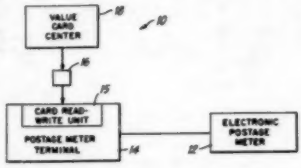
a liquid in the hollow void of the portion of the keyboard-supporting member for enhancing visual effects.

4,893,000

SYSTEM FOR SECURELY CONTROLLING POSTAGE FUNDS

Winslow E. Jackson, Monroe, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 8, 1988, Ser. No. 153,392
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—380 **12 Claims**



1. A system for securely controlling postage meter funds comprising:

a value card center for receiving funds from a customer and issuing integrated circuit value card means, said card means having postage funds and a public-key encryption key encoded therein; and

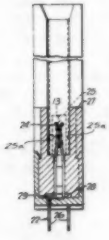
postage meter terminal means for communicating an appropriate public-key decryption key to said card means, whereupon postage funds may be accessed from said card means to authorize printing of postage indicia.

4,893,001

IC CARD

Isao Ohkubo, Kawasake, and Shintaro Aiba, Kanagawa, both of Japan, assignors to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 3,668, Jan. 15, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,295
Claims priority, application Japan, Jan. 20, 1986, 61-8090
Int. Cl.[4] H05K 1/14
U.S. Cl. 235—490 **5 Claims**



1. An IC card comprising:

a flat, relatively thin housing having an elongated edge;

a slot formed lengthwise in said edge;

a printed circuit member in said housing generally aligned with said slot;

at least one active device mounted on said printed circuit member;

said printed circuit member having a border region extending into said slot;

said border region providing upper and lower planar surfaces within said slot adjacent to said edge;

a row of spaced terminals on one of said surfaces of said printed circuit member; and

said housing embodying separation walls extending from the sides of said slot to said upper and lower surfaces of said border region of said printed circuit member to support said border region, said separation walls being located between said terminals.

4,893,002

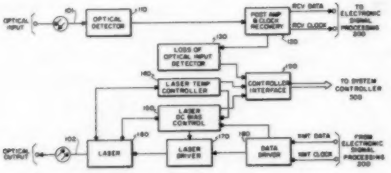
LOSS OF OPTICAL INPUT CIRCUIT

Miklos J. Kollanyi, Albuquerque, N. Mex., assignor to AG Communications Systems Corporation, Phoenix, Ariz.

Continuation of Ser. No. 944,042, Dec. 22, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 248,310

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 R **3 Claims**



1. A loss of optical signal detector used with a signal generating circuit to detect the loss of an optical input signal, said signal generating circuit arranged to develop a signal voltage when said optical input drops below a preset threshold, said loss of optical signal detector comprising:

signal coupling means including a first transistor having its base lead connected to said signal voltage from said signal generating circuit and its collector connected to a source of voltage and current and responsive to the application of said signal voltage from said signal generating circuit said first transistor turns on connecting said source of voltage and current to said first transistor emitter lead;

signal voltage means including first and second resistors connected to said first transistor emitter lead, said signal voltage means arranged to receive said voltage and current from said signal coupling means and produce an output signal representing the loss of the optical signal;

comparator means having a second transistor connected to said signal voltage means and a third transistor connected to said second transistor and to a reference voltage, said third transistor producing an alarm voltage in response to the application of said output signal from said signal voltage means to said second transistor when said signal voltage means output signal is greater than said reference voltage; and,

alarm signal generating means connected to said comparator means third transistor, said alarm signal generating means receiving said alarm voltage and producing and sending an alarm signal to a controller interface indicating the loss of said optical input signal.

4,893,003

CIRCLE-TO-LINE INTERFEROMETER OPTICAL SYSTEM

Paul B. Hays, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

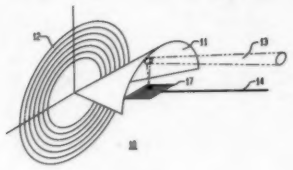
Filed Sep. 19, 1988, Ser. No. 246,096

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—216 **17 Claims**

1. An optical system for converting information in the form of a circular ring of electromagnetic radiation to a linear form, the optical system comprising:

reflector means having a reflective surface configured at least in part as an internal conical surface, for receiving and reflecting the electromagnetic radiation; and



linear detector means arranged to receive the electromagnetic radiation reflected by said reflective surface of said reflector means.

4,893,004

REFLECTION TYPE PHOTOELECTRIC SWITCH FOR DETECTING THE PRESENCE OF AN OBJECT

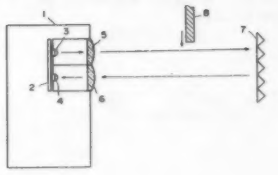
Arata Nakamura, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 28, 1987, Ser. No. 138,052

Claims priority, application Japan, Dec. 26, 1986, 61-312456

Int. Cl.[4] G01V *9/04*; G06M *7/00*; H01J *40/14*

U.S. Cl. 250—221 **14 Claims**



1. A reflection type photoelectric switch which detects the presence of an object, comprising:

light emitting means for emitting a substantially single light beam having first and second different wavelengths into a space in which the object may be detected,

a reflector for reflecting said substantially single light beam at different reflection rates with respect to said first and second wavelengths,

light receiving means for sensing said first and second wavelengths of the reflected light beam and which generates outputs in response to said first and second wavelengths, and

means for analyzing said outputs generated by said light receiving member to generate an output representing the existence in the space of the object detected by the photoelectric switch.

4,893,005

METHOD AND APPARATUS FOR AREA AND PERIMETER SECURITY WITH REFLECTION COUNTING

Ariel Stiebel, Bloomfield Hills, Mich., assignor to Development/Consulting Associates, Troy, Mich.

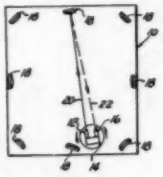
Continuation of Ser. No. 850,725, Apr. 11, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,113

Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—221 **10 Claims**

1. A method for detecting disturbance in a protected area or perimeter, said method comprising emitting a beam of radiation along a predetermined path, rotating said beam of radiation for a complete revolution along said predetermined path, positioning a plurality of individual reflectors along said prede-

termined path within said area or perimeter, counting a base number of beam reflections for said complete revolution of said beam after activation, storing said base number for establishing a beam reflection number corresponding to a normal state in



said area or perimeter, counting a number of beam reflections for each subsequent revolution of said beam, comparing said counted number with said stored base number, and triggering an alarm when said counted number is different from said stored base number.

4,893,006

OPTICAL TIME DOMAIN REFLECTOMETER WITH LEVEL ADJUSTING FUNCTION

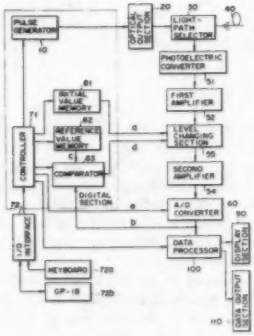
Toshiyuki Wakai, and Toshiyuki Kashiwabara, both of Atsugi, Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,995

Claims priority, application Japan, Oct. 19, 1987, 62-261850; Sep. 30, 1988, 63-244226

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **12 Claims**



1. An optical time domain reflectometer comprising:

optical pulse supplying means for supplying an optical pulse to a target optical fiber;

reflection light detecting means for outputting an electric signal corresponding to reflection light from said target optical fiber;

level control means for receiving said electric signal from said reflection light detecting means and controlling said electric signal to have a level according to an initial value or a compensation value;

A/D converting means for converting an output of said level control means into a digital signal;

parameter input means for entering a parameter for determining a level indicating reflection light from said target optical fiber;

initial value storage means for storing said initial value to be set in said level control means in accordance with a parameter from said parameter input means;

compensation value computing means comparing said digital signal from said A/D converting means corresponding to said initial value with a reference value and computing said compensation value to be set in said level control means; and

processing means for processing said digital signal from said A/D converting means to output said digital signal.

4,893,007

ROTARY MACHINE WITH A MEASURING DEVICE FOR THE ANGLE OF ROTATION

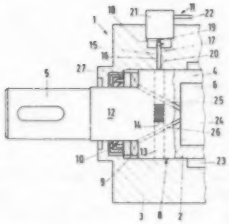
Jorgen C. Stannow, Sonderborg; Bruno Wolff, Malov; Niels H. Gade, Sonderborg; Ib M. Espensen, and Knud Blohm, both of Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 29, 1988, Ser. No. 188,213

Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716464

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **9 Claims**



1. A rotary machine having an angle of rotation measuring capability, comprising a machine housing having a housing bore, a machine rotor within the housing bore and rotor mounting means mounted within the machine housing for rotatably mounting the rotor, said rotor having circumferentially spaced markings thereon and within the machine housing and scanner means for sensing the markings for determining the angle of rotation, the scanner means including a sensor element mounted by the machine housing and extending into the housing bore into closely adjacent relationship to the markings.

4,893,008

SCANNING OPTICAL MICROSCOPE

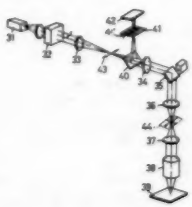
Yoshiaki Horikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,277

Claims priority, application Japan, Jun. 9, 1987, 62-142218

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—234 **11 Claims**



1. A scanning optical microscope comprising:

a light source;

an objective lens for focusing light emitted from said light

source upon an object to form a minute light spot on said object;

a light deflecting optical system arranged between said light source and said objective lens and including at least one acousto-optic light deflector for varying the angle of incidence on said objective lens of the light emitted from said light source so as to scan said object with said light spot;

light splitting means provided in said light deflecting optical system and between said acousto-optic light deflector and said objective lens for taking out at least a part of the light coming from said object;

focusing means for focusing the light taken out by said light splitting means;

light shielding means arranged in the focusing position of said focusing means and having an elongated aperture, the longitudinal direction of said elongated aperture being coincident with the direction of movement of the light in said focusing position; and

photoelectric transducing means for receiving the light passing through said aperture of said light shielding means.

4,893,009

SCANNING ELECTRON MICROSCOPE AND THE LIKE APPARATUS

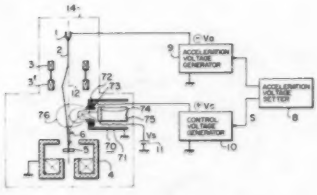
Katsuhiro Kuroda, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 310,920

Claims priority, application Japan, Feb. 26, 1988, 63-41986

Int. Cl.[4] H01J *37/28, 37/244*

U.S. Cl. 250—310 **4 Claims**



1. A scanning electron microscope comprising:

an electron beam source for producing a finely focused primary electron beam;

means for applying to said electron beam source an acceleration voltage for accelerating the primary electron beam;

a specimen bombarded with the accelerated primary electron beam;

a secondary electron detector for detecting secondary electrons released from said specimen;

means for applying to said secondary electron detector a voltage for attracting the secondary electrons to said secondary electron detector; and

electric field control means for changing intensity of an electric field created by the voltage applied to said secondary electron detector in the path of the accelerated primary electron beam, in compliance with the change of the acceleration voltage applied to said electron beam source.

4,893,010

IMAGE RECORDING APPARATUS

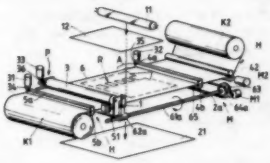
Yoshiya Tomatsu, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jul. 12, 1988, Ser. No. 217,632

Claims priority, application Japan, Jul. 15, 1987, 62-176849

Int. Cl.[4] G01U *15/00*

U.S. Cl. 250—318 **12 Claims**



1. An image recording apparatus which produces an image on a photosensitive recording medium through a light transmissive member which carries thereon a light shieldable mask image, comprising:

a mask image forming means provided at a mask image forming zone for forming said light shieldable mask image on said light transmissive member, said light shieldable mask image corresponding to color information derived from a colored original;

exposure means for exposing said photosensitive recording medium to light through said light transmissive member carrying said mask image in an exposure zone for forming a latent image on said photosensitive recording medium corresponding to said mask image, said mask image forming zone being identical with said exposure zone;

developing means disposed at a downstream side of said exposure means for developing said latent image into a visible image on said photosensitive recording medium; and,

a holding means for selectively holding portions of said light transmissive member extending outside of said exposure zone and maintaining a segment of said light transmissive member stationary in said exposure zone during the mask image formation and during the exposure in accordance with said color information.

4,893,011

METHOD OF PROCESSING X-RAY FILM CASSETTES WITH PHOSPORUS-COATED FILMS AND A READING STATION FOR EXECUTING THE PROCESS

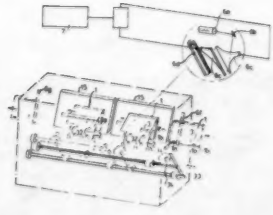
Walter Bauer; Jürgen Müller, both of Munich, and Volkmar Voigtländer, Eichenau, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 238,034

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731203

Int. Cl.[4] G03G *5/16;* **H05B** *33/00;* **B65B** *21/02, 69/00*

U.S. Cl. 250—327.2 **10 Claims**



3. A reading station for processing an X-ray film cassette

formed of a bottom part and a lid pivotable one relative to another and containing an X-ray receiving film coated with a layer of stimulatable phosphorus which faces towards said bottom part, wherein said film is exposed to X-rays to produce thereon a latent image, the reading station comprising housing means having an inlet opening for insertion the cassette with the film therein into the reading station and an outlet opening aligned with said inlet opening and formed opposite thereto for discharging the cassette from the reading station; two cassette positioning means for positioning the cassette in said reading station, a first one of said positioning means being located next to said inlet opening and a second one of said positioning means being located next to and before said outlet opening and in alignment with said first positioning means; means for removing the film from the cassette, a laser beam scanner for bringing said latent image to luminescence so that emitted light converts said image into digital electric signals; a central memory for storing said digital image signals; means for erasing said film by exposing the same to visible light; a film platform receiving the film removed from the cassette, said first and second positioning means guiding said film platform with the film therein in a direction perpendicularly to a scanning direction of the laser beam scanner (*6a, 6b*) which scans the film; a light-conductive element (*6c*) and a photomultiplier connected to the central memory, said erasing means including a lamp, said positioning means linearly moving said platform with the film by said light-conductive element and said lamp from an initial position to an end position, said positioning means including means transporting said cassette in the same direction as said platform with the film to a position corresponding to said end position; means inserting the film removed from the platform into said cassette at said corresponding position; and means closing the lid of said cassette, said cassette with the erased film therein being discharged from the reading station through said outlet opening.

4,893,012

RADIATION IMAGE READ-OUT AND REPRODUCING APPARATUS

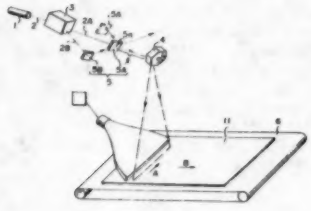
Toshitaka Agano; Ryousuke Furue; Hiroyuki Karasawa, and Ichirou Miyagawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 18, 1988, Ser. No. 195,333

Claims priority, application Japan, Jan. 13, 1987, 62-5266; Jul. 14, 1987, 62-175487; Jul. 14, 1987, 62-175488; Dec. 29, 1987, 62-335505

Int. Cl.[4] G03B *42/08*

U.S. Cl. 250—327.2 **9 Claims**



1. An image read-out and reproducing apparatus comprising:

(i) a light beam source for producing a light beam,

(ii) a acousto-optic modulator provided in an optical path of said light beam,

(iii) a change-over means for selectively guiding either one of a zero-order light component and a first-order light component, which are radiated by said acousto-optic modulator, to a predetermined optical path,

(iv) a light deflector positioned in said predetermined optical path for deflecting the incident light beam and scanning an image information sheet carrying an image recorded thereon or a recording sheet, on which said image is to be reproduced, by the deflected light beam in a main scanning direction,

(v) a sub-scanning means for moving said image information sheet or said recording sheet with respect to said light beam in a sub-scanning direction approximately normal to said main scanning direction, and

(vi) a light detection means for detecting light obtained from said image information sheet when said image information sheet is scanned by said light beam,

wherein in the course of movement of said image information sheet by said sub-scanning means, said change-over means guides said zero-order light component to said predetermined optical path so that said zero-order light component is deflected by said light deflector to scan said image information sheet in the main scanning direction and the light obtained from said image information sheet is detected by said light detection means, so as to carry out read-out of said image from said image information sheet, and

in the course of movement of said recording sheet by said sub-scanning means, said change-over means guides said first-order light component to said predetermined optical path and said first-order light component is modulated by said acousto-optic modulator in accordance with image signals, so that the modulated first-order light component is deflected by said light deflector to scan said recording sheet in the main scanning direction, so as to carry out reproduction of said image on said recording sheet.

4,893,013

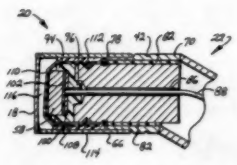
DETECTOR AND LOCALIZER FOR LOW ENERGY RADIATION EMISSIONS

Dennis J. Denen; Marlin O. Thurston, and Raymond C. Ramsey, all of Columbus, Ohio, assignors to Neoprobe Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 27,197, Mar. 17, 1987, Pat. No. 4,801,803. This application Sep. 23, 1988, Ser. No. 248,920

Int. Cl.[4] G01T *1/161*

U.S. Cl. 250—336.1 **5 Claims**



1. An instrument for detecting and locating sources of radiation emission having predetermined energy levels, comprising:

a housing having interior walls defining an interior cavity and first portion having sidewalls formed of select gamma radiation attenuating material and exhibiting an electrical shielding effect and extending to a forward opening positionable proximate said source, and a hand graspable second portion extending from said first portion;

window means for permitting transmission of gamma radiation of energy level at least as low as 27 kev through said forward opening while blocking the passage of light;

blocking means formed of material selected for attenuating gamma radiation of said predetermined energy levels, having an outer surface, supportable within said housing and having a portion extensible within said housing first portion to a base support surface;

elastomeric means intermediate said housing and said blocking means for retaining said blocking means spaced from said housing interior wall;

electrically insulative support means mounted upon said

blocking means base support surface and having a mounting surface positioned outwardly from said base support surface;

a resiliently compressible shock cushion layer positioned in adjacency over said insulative support means and having an outwardly disposed surface;

a gamma radiation responsive crystal having a rearwardly disposed surface positioned in adjacency with said shock cushion layer and having a forwardly disposed surface;

grounding means for electrically grounding said crystal forwardly disposed surface;

biasing means for applying an electrical bias to said crystal rearwardly disposed surface;

elastomeric retainer means positioned over the assemblage of said support means, said shock cushion layer, and said crystal for effecting their compressed mutual association;

retaining means for positioning said housing first position over said assemblage and said blocking means portion such that said crystal forwardly disposed surface is spaced from said window means an amount establishing a dead air space therebetween.

4,893,014

MOVEMENT MONITOR HAVING AN INFRARED DETECTOR

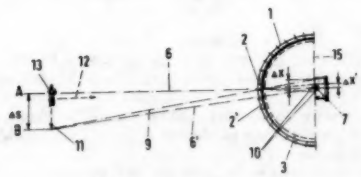
Berthold Geck, Altena, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,225

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742031

Int. Cl.[4] G01J *5/08*

U.S. Cl. 250—353 **20 Claims**



1. Movement monitor having an infrared detector, comprising collecting optics focusing thermal radiation picked up from a radiating object in a monitored zone, at least one sensor being sensitive in the infrared band, said at least one sensor receiving the focused thermal radiation from said collecting optics and transmitting a signal upon a predetermined change in infrared radiation received by said at least one sensor for tripping a switching function, said collecting optics being formed of a cylindrical section being axially divided into segments each effecting focusing with a principal ray directed onto said at least one sensor, and deflecting optics in the vicinity of said collecting optics deflecting a portion of each bundle of rays incident parallel to the principal ray of a segment and forming at least two radiation maxima striking said at least one sensor one after another upon the occurrence of a corresponding change in the position of the radiating object.

4,893,015

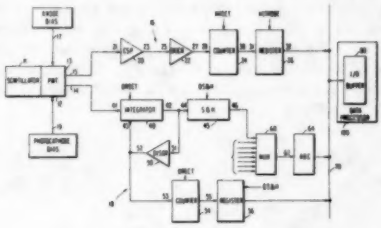
DUAL MODE RADIOGRAPHIC MEASUREMENT METHOD AND DEVICE

Klaus Kubierschky, North Reading, and Herbert L. Aronson, Newton, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Apr. 1, 1987, Ser. No. 32,692

Int. Cl.[4] G01T *1/208*

U.S. Cl. 250—369 **14 Claims**



1. A radiation measuring device for measuring a wide range of X-ray intensities comprising:

a scintillator crystal for emitting light in response to irradiation by X-rays;

photodetector means optically coupled to said scintillator crystal for receiving the emitted light and converting said emitted light into electrical current, said photodetector means comprising first and second outputs;

first and second analyzing means respectively responsive simultaneously to said first and second outputs;

said first analyzing means coupled to said first output of said photodetector means for counting discrete electronic pulses generated by said photodetector means, said first analyzing means producing a first output signal;

said second analyzing means operated simultaneously with said first analyzing means coupled to said second output of said photodetector means, said second analyzing means including integrating means for integrating current generated by said photodetector means, said second analyzing means producing a second output signal;

receiving means responsive to said first and second output signals for measuring detected radiation.

4,893,016

GAS-COOLED SEMICONDUCTOR RADIATION DETECTOR

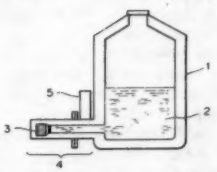
Masaki Katagiri, Ibaraki, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 10,468, Feb. 3, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 247,432

Claims priority, application Japan, Apr. 2, 1986, 61-22754

Int. Cl.[4] G01T *1/24*

U.S. Cl. 250—370.09 **1 Claim**



1. In a gas-cooled semiconductor detection system for detecting gamma rays while a semiconductor detection device is

cooled to a temperature in the neighborhood of the temperature of liquid nitrogen with a refrigerator that is composed of an adiabatic expansion valve, a heat exchanger and a cooling section and which makes use of the adiabatic expansion of air or nitrogen gas, the improvement wherein a gas-permeable fibrous or screen-like material such as cotton wool, gauze or felt envelopes the periphery of the gas outlet of said adiabatic expansion valve located at the tip of the refrigerator in direct contact therewith such that air vibrations which occur in a space between said adiabatic expansion valve and said cooling section when a gas is released from the adiabatic expansion valve and mechanical vibrations which occur when the gas directly collides with the cooling section are sufficiently damped thereby to improve the energy resolution of the spectrometry of gamma rays that is attainable by the gamma rays detection system.

4,893,017

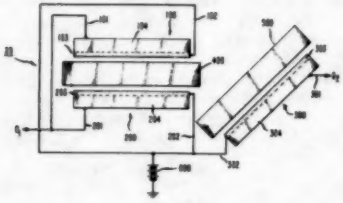
DOSE AND DOSE RATE SENSOR FOR THE POCKET RADIAC

Stanley Kronenberg, Skillman, N.J., assignor to The United State of America as represented by the Secretay of the Army, Washington, D.C.

Filed Oct. 14, 1988, Ser. No. 260,425

Int. Cl.[4] G01T *3/08*

U.S. Cl. 250—370.07 **7 Claims**



1. A radiation detector for detecting gamma and neutron radiation at high dose rates comprising a first silicon photodiode, a second silicon photodiode, a third silicon photodiode, biasing means, a slab of silicon and a slab of polyethylene,

said first and second silicon photodiodes being reverse biased by said biasing means and positioned on either side of said slab of polyethylene such that the depleted layer of each of said first and second silicon photodiode is adjacent said slab of polyethylene,

said third silicon photodiode being reverse biased by said biasing means and positioned next to said slab of silicon such that the depleted layer of said third silicon photodiode is adjacent said slab of silicon,

the outputs of said first and second silicon photodiodes being combined to yield a first analog signal proportional to the neutron dose and gamma ray dose absorbed by said first and second silicon photodiodes, and the output of said third silicon photodiode yielding a second analog signal proportional to the gamma ray dose absorbed by said third silicon photodiode.

4,893,018

RADIATION DETECTING CIRCUIT INCLUDING POSITIONAL ERROR CALIBRATOR

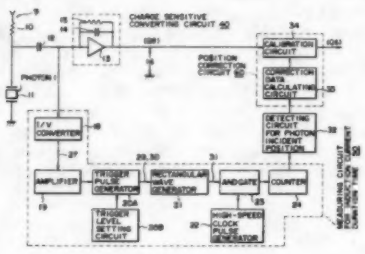
Satoshi Saitou, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 20, 1987, Ser. No. 51,644

Claims priority, application Japan, May 21, 1986, 61-116869; May 28, 1986, 61-122818

Int. Cl.[4] G01T *1/22*

U.S. Cl. 250—370.10 **16 Claims**



1. A radiation detecting circuit arrangement comprising:

a semiconductor radiation detector having two electrodes to sandwich the detector, to which a predetermined biasing voltage is being applied, for detecting radiation energy incident thereon to derive an electric signal;

a converting circuit for converting total electric charge induced in the detector into a corresponding voltage in response to the electric signal detected from the detector;

a circuit for measuring a duration time period of induction current caused by movement of electrons occurring in the detector in response to the detected electric signal;

a circuit for detecting a position of the radiation incident upon the detector on the basis of said duration time period of induction current to produce a positional signal of the incident radiation; and

a circuit for correcting the voltage output from the converting circuit based upon the positional signal of the incident radiation to thereby produce an energy value of the radiation independent of the incident position thereof.

4,893,019

ION CURRENT GENERATOR SYSTEM FOR THIN FILM FORMATION, ION IMPLANTATION, ETCHING AND SPUTTERING

Tatsuo Oomori; Kouichi Ono, and Shigeto Fujita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,236

Claims priority, application Japan, May 27, 1987, 62-134289; Jul. 27, 1987, 62-186839; Aug. 19, 1987, 62-205763

Int. Cl.[4] H01J *37/08*

U.S. Cl. 250—423 R **77 Claims**

1. An ion current generator comprising:

material atoms supply means for supplying a particle current having material atoms to a predetermined region;

laser generating means for supplying laser radiation to said region to excite said material atoms to a Rydberg state; and

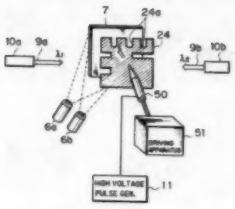
electric field application means for applying a predetermined electric field to said material atoms in said Rydberg state so that said material atoms are ionized to be led to a predetermined direction, wherein said electric field application means includes:

a substrate,

an electrode provided to face said substrate, and

a power source for supplying a predetermined electric potential to said electrode to generate an electric field

between said substrate and said electrode wherein said electrode has a surface facing said substrate, said surface being irregularly shaped so as to have a first region spaced from said substrate by a first distance and a second region spaced from said substrate by a second



distance where said second distance is greater than said first distance;

said first region faces a region on said substrate to which an ion current is to be supplied and said second region faces a region on said substrate to which said ion current is not to be supplied.

4,893,020

X-RAY FLUORESCENT IMAGE INTENSIFIER

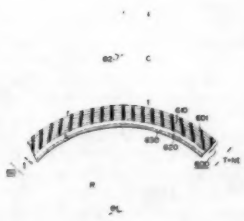
Katsuhiro Ono, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 17, 1987, Ser. No. 134,157

Claims priority, application Japan, Dec. 18, 1986, 61-299984

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—483.1 **11 Claims**



1. An X-ray fluorescent image intensifier comprising:

an input screen for emitting photoelectrons responsive to an incident X-ray image, said input screen including an input substrate which is constituted by a lamination of a plurality of mesh plates having a plurality of apertures having walls which are thicker in the central portion of the walls than at the peripheral portion of the walls, said input screen further having a plurality of through holes constituted by interconnection of said apertures and Na-activated CsI phosphor particles buried in said through holes and a photocathode formed on said input substrate;

means for accelerating and focusing said photoelectrons;

an output screen for displaying responsive to said accelerated and focused photoelectrons, an optical image.

4,893,021

PROCESS FOR THE PRODUCTION OF MULTIPLE RADIOGRAPHIC IMAGES

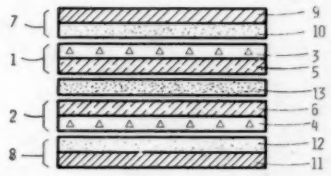
Romain H. Bollen, Sint-Truiden, and Raymond L. Florens, Edegem, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jan. 11, 1988, Ser. No. 141,766

Claims priority, application European Pat. Off., Jan. 27, 1987, EP87200119.3

Int. Cl.[4] G03B *42/04*

U.S. Cl. 250—487.1 **26 Claims**



1. A process for the production of two radiographic images comprising the steps of providing two X-ray fluorescent screens, exposing said screens to a single shot X-ray exposure while each screen is associated with a photo-sensitive silver halide emulsion layer or silver halide emulsion layer part whereby said layer is exposed with the light emitted by the associated screen, and, during such exposure, locating said silver halide emulsion layer between a fluorescent layer of said X-ray fluorescent screen and a visible light reflecting layer which comprises white pigment particles and has a diffuse white reflection density of less than 0.30, in order that the latent silver images obtained in said silver halide emulsion layers or layer parts thereof are developed to form visible images.

4,893,022

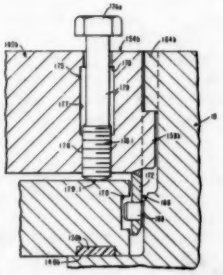
CLOSURE FOR CASKS CONTAINING RADIOACTIVE MATERIALS

George V. B. Hall, Bethel Park, Pa., and Charles W. Mallory, Severna Park, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1987, Ser. No. 109,507

Int. Cl.[4] G21F *5/00*

U.S. Cl. 250—506.1 **15 Claims**



1. An improved closure for covering and sealing an opening in a single cask for containing radioactive material, wherein said opening is characterized by a ledge comprising:

a. an inner lid receivable within said opening and having a gasket means that is seatable over said ledge;

b. an outer lid which is likewise receivable into said opening

and securable therearound when said outer lid is rotated relative to said opening, said inner lid remaining stationary relative to said cask opening when said outer lid is rotated and having no torque applied thereto by said outer lid when said outer lid is rotated, and

c. bolt means threadedly mounted through said outer lid for applying a compressive force between said inner and outer lids after said outer lid has been secured to said opening in order to depress the gasket means of said inner lid into sealing engagement with said ledge while avoiding the application of torsion between said gasket means and said ledge.

4,893,023

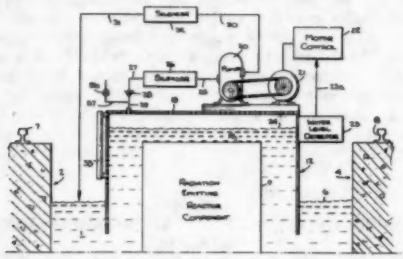
RADIATION SHIELDING APPARATUS

William A. Homyk, R.D. #1, Martin Rd., Hopewell Junction, N.Y. 12533

Division of Ser. No. 108,482, Oct. 14, 1987, Pat. No. 4,851,185. This application Sep. 29, 1988, Ser. No. 250,523

Int. Cl.[4] G21C *11/00*

U.S. Cl. 250—515.1 **7 Claims**



1. In apparatus for shielding a radiation emitting component which is immersed in a pool of liquid in a tank with an upper portion of the component extending above the upper surface of the liquid of said pool, said tank being at atmospheric pressure, said apparatus comprising:

a vessel having a top end wall, a side wall extending downwardly from said top wall and secured at its upper end in gas tight relation to said top end wall to provide a vessel which is gas tight except at its lower end which is open, said side wall having an inner circumferential size greater than the circumferential size of said upper portion of said component and a height at least equal to the height of said portion for receiving said portion within said vessel and said vessel being of a size receivable within said tank;

pumping means connected for fluid flow to the upper end of the interior of said vessel for removing fluid from the upper end of the latter and thereby creating a vacuum in at least a portion of said vessel and raising the level of the upper surface of said liquid to at least the upper end of said portion of said component;

reinforcing means secured to said top end wall and said side wall for preventing collapse of said top end wall and said side wall with evacuation of said vessel; and

suspending means connected to said vessel for suspending said vessel with the lower end of said side wall immersed in said pool of liquid and with said wall encircling said upper portion of said component.

4,893,024

APPARATUS FOR MEASURING THE THICKNESS OF A THIN FILM WITH ANGLE DETECTION MEANS

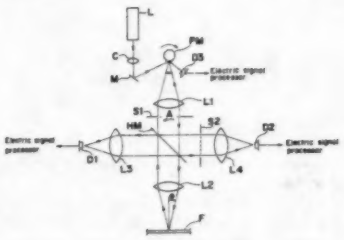
Katsue Koashi, Toyonaka, and Yosuke Eguchi, Takatsuki, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan

Filed May 25, 1988, Ser. No. 198,494

Claims priority, application Japan, May 25, 1987, 62-128962; May 20, 1988, 63-124155

Int. Cl.[4] G01N *21/86*; H01J *3/14*

U.S. Cl. 250—560 **8 Claims**



1. An apparatus for measuring the thickness of a thin film, having top and bottom surfaces, utilizing an interferometric method, comprising:

a light emitting means for generating a monochromatic light beam;

a beam scanning means including a deflection means for deflecting the light beam continuously and repeatedly and a lens means, having an optical axis, for projecting the deflected light beam on a thin film arranged substantially perpendicular to said optical axis of said lens means, said deflection means deflecting the light beam so as to scan it symmetrically with respect to a normal of the thin film to be measured;

an angle detection means including a half mirror for splitting the light beam into an impinging beam for impinging onto the thin film and a reference beam and a light receiving means for detecting an incident angle of said impinging beam with respect to the thin film by receiving said reference beam after having been split by said half mirror, said half mirror being arranged on an optical path from said deflection means to said lens means and inclined at 45° with respect to said optical axis of said lens means;

an interference pattern detection means for detecting an interference pattern which is caused by interference between light beams reflected from the top and bottom surfaces of the thin film having passed through said lens means of said beam scanning means and deflected by a rear surface of said half mirror; and

a calculating means for calculating the thickness of the thin film based on said interference pattern detected by said interference pattern detection means and the incident angle of the impinging beam detected by said angle detection means.

4,893,025

DISTRIBUTED PROXIMITY SENSOR SYSTEM HAVING EMBEDDED LIGHT EMITTERS AND DETECTORS

Sukhan Lee, 4913 Revlon Dr., La Canada, Calif. 91011

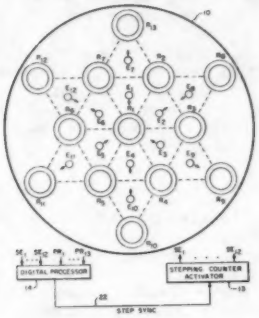
Filed Dec. 30, 1988, Ser. No. 292,047

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—561 **8 Claims**

1. A distributed sensor system for robotics comprised of multiple proximity sensors embedded on the surface of a robotic moving member, each proximity sensor comprising a defined pattern of interspersed light emitters and receivers, each receiver having an aperture with a lens focusing light

onto an array of photosensitive devices, and each light emitter comprising a light emitting diode and an optical guide to form a light beam with its axis tilted slightly toward the center of an



adjacent receiver that is either closer or further from the center of said defined pattern, and with a dispersion angle sufficient to span said aperture of one of said light receivers toward which it is tilted.

4,893,026

STATION FOR DETECTING AND LOCATING THROUGH LASER BEAMS AN OBJECT OR A SUBSTANCE LIKELY TO DIFFUSE BACK AT LEAST ONE PART OF THE INCIDENT LASER RAY AND SYSTEM FOR SENSING A SUBSTANCE SUCH AS SMOKE IN PARTICULAR OF A FIRE SUCH AS A FOREST FIRE

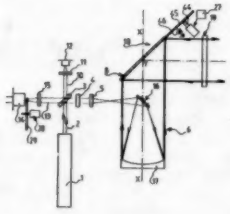
Francois Brown de Colstoun, 5755 E. River Rd., #2602, Tucson, Ariz. 85715; Jean-Paul Chambaret, 161 Avenue Paul Vaillant Couturier, 94250 Gentilly, France; Yves Chambaret, 77 Avenue Parmentier, 75011 Paris, France; Arnaud G. Le Saige de la Villesbrunne, 108 Boulevard de la Reine, 78000 Versailles, France, and Jean-Claude M. Moscovici, 66 Avenue Victor Hugo, 75116 Paris, France

Continuation-in-part of Ser. No. 947,892, Dec. 20, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 162,871

Claims priority, application France, Dec. 31, 1985, 85 19508

Int. Cl.[4] G01H *15/06*

U.S. Cl. 250—574 **17 Claims**



1. A station for detecting and locating through laser rays an obstacle such as an object or a substance likely to retrodiffuse at least one part of an incident laser ray, in particular fire smoke such as forest fire smoke, comprising

a laser source emitting recurrent pulses,

an optical device through which rays emitted and retrodiffused travel and provided with a device for separating emitted and retrodiffused rays and a device for enlarging and reducing the diameter of parallel beams as the beams are admitted or retrodiffused, wherein

the optical device comprises a revolving optical assembly rotatably arranged within the beam travel path portion of larger diameter and oriented such that the emitted laser beams perform a predetermined sweeping motion,

the revolving optical assembly being driven by a step-by-step motor, and

wherein a data processing device is provided which includes

memory means in which data are stored for each angular position of the revolving optical device corresponding to one step thereof, which are representative of distance of a location of a zone to be controlled from a reference scan plane, and

a control device is provided for pivoting the optical assembly about a horizontal axis to enable the assembly to sweep said location in response to a control signal developed by said control device from the said stored data.

4,893,027

PROXIMITY SWITCH INSENSITIVE TO INTERFERENCE FIELDS

Heinz Kammerer, Ostfildern, and Reinhard Stumpe, Neuhausen; both of Fed. Rep. of Germany, assignors to Gebhard Balluff Fabrik Feinmechanischer Erzeugnisse GmbH & Co., Neuhausen, Fed. Rep. of Germany

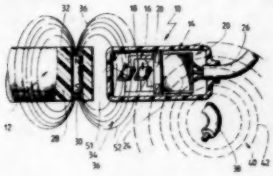
PCT No. PCT/DE87/00426, § 371 Date May 20, 1988, § 102(e) Date May 20, 1988, PCT Pub. No. WO88/02579, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 21, 1987, Ser. No. 219,065

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632624

Int. Cl.[4] H03K *17/95*

U.S. Cl. 307—116 **49 Claims**



1. A proximity switch for detecting the position of a machine element comprising:

at least one sensor providing a first signal having a total signal comprising a detection field signal component caused by a machine element in proximity with said at least one sensor and in interference field signal component caused by an interference field;

circuit means, responsive to said first signal for providing an output signal as a function of the detection field signal component, said circuit means including:

means for providing a sequence of scanning pulses in response to a time dependence of said interference field;

means for scanning said first signal with said scanning pulses; and

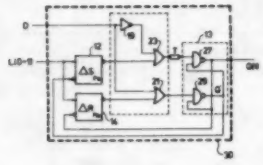
means for providing a threshold signal in response to the scanning pulses indicating that said machine element is in a position to be detected, wherein the value of the threshold signal is preselectable to a minimum value with which a minimum field strength required for response of said proximity switch is established.

4,893,028

ONE OR MORE INPUT ASYNCHRONOUS REGISTER

Angelo Beltramini, Novara, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Jul. 1, 1988, Ser. No. 214,381
Claims priority, application Italy, Jul. 7, 1987, 21201 A/87
Int. Cl.[4] H03K *3/037*
U.S. Cl. 307—291 **25 Claims**



1. A register comprising:

an output flip-flop having set and reset inputs and at least one output signal line;

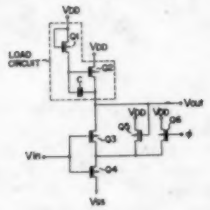
a first gating means for applying an input signal D and its complement $\overline{D}$ respectively to said reset and set inputs under control of a switching edge of an applied input load control signal L, said first gating means operating such that said input signal D and its complement $\overline{D}$ are applied to said reset and set inputs, upon occurrence of a predetermined switching edge of said load control signal only for a period of time sufficient to cause a switching of the state of the output state of said flip-flop by one of said D and $\overline{D}$ signals, said period ending when at least one feedback signal, responsive to said state switching, indicates by a predetermined switching edge that said state switching has occurred.

4,893,029

POWER SUPPLY NOISE PROTECTION CIRCUIT

Ryosuke Matsuo, Yokohama, and Masaru Koyanagi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1988, Ser. No. 167,687
Claims priority, application Japan, Mar. 25, 1987, 62-70766
Int. Cl.[4] H03K *17/16, 3/01, 19/017*
U.S. Cl. 307—296.4 **10 Claims**



1. A semiconductor integrated circuit having an input circuit, an internal circuit, and an output circuit formed together on a single chip, each of said circuits being connected to common power source lines, said input circuit comprising:

a load circuit coupled between a power source potential supply terminal and a signal output terminal;

first and second FETs, of the same conductivity type, serially connected between said signal output terminal and a common potential supply terminal and having a series connecting point therebetween, each of said first and second FETs having a gate connected to receive an input signal;

a third FET connected between said power source potential supply terminal and the series connecting point of said first and second FETs, said third FET having a gate connected to said signal output terminal;

a fourth FET, connected between a predetermined potential and the series connecting point of said first and second FETs, and

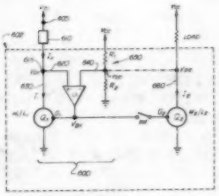
control means, responsive to operation of either of said internal circuit or said output circuit, for turning on said fourth FET for a predetermined period of time when the operation of said terminal circuit or said output circuit is likely to cause the potentials of the common power source lines to fluctuate.

4,893,030

BIASING CIRCUIT FOR GENERATING PRECISE CURRENTS IN AN INTEGRATED CIRCUIT

Gerald W. Shearer, Orange; Karl M. J. Lofgren, Long Beach, and Kenneth W. Ouyang, Huntington Beach, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation of Ser. No. 937,983, Dec. 4, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 233,847
Int. Cl.[4] G05F *1/56*
U.S. Cl. 307—296.8 **36 Claims**



1. A biasing circuit for generating a reference bias level that can be applied to a first gate terminal of an active operating device, where the operating device is integrally formed in an integrated circuit and first gate terminal controls the magnitude of a first current passing through the operating device by way of first and second output terminals of the operating device, an operating device output voltage being developed between the first and second output terminals, the biasing circuit comprising:

an active exemplary device which is integrally formed in the same integrated circuit together with the operating device, wherein the exemplary device includes a second gate terminal and third and fourth output terminals, the second gate terminal controlling the magnitude of a second current passing through the exemplary device by way of the third and fourth output terminals and the magnitude of an exemplary device output voltage developed between the third and fourth output terminals, the exemplary device being formed in the integrated circuit such that the exemplary device operating characteristics, characterized by the relationship between the second current and the exemplary device output voltage, are substantially a copy of, or a replica scaled in accordance with a predetermined scaling of, the operating device operating characteristics, characterized by the relationship between the first and current and the operating device output voltage;

reference means, connected in series with the exemplary device, for forcing the magnitude of the second current to be equal to a predetermined reference value;

voltage establishing means for establishing a desired voltage;

control means, coupled to the voltage establishing means and the exemplary device, for sensing the exemplary device output voltage developed between the third and fourth output terminals, comparing the sensed exemplary device output voltage to the desired voltage, and supplying a bias level to the second gate terminal to drive the

exemplary device output voltage toward the desired voltage; and

bias level duplicating means, connected to the operating device and the control means, for applying to the first gate terminal a duplicate of the bias level supplied to the second gate terminal, thereby creating a condition wherein the magnitude of the first current will be substantially a precision copy or a precisely scaled replica of the magnitude of the second current when an operating output voltage, substantially equal to the exemplary device output voltage, develops between the first and second output terminals of the operating device;

wherein the bias level duplicating means includes a switching means for applying the duplicate bias level to the operating device for a first time duration.

4,893,031

LOGICAL CIRCUITS FOR PERFORMING LOGICAL FUNCTIONS WITHOUT A POWER SUPPLY

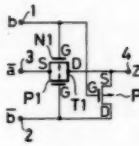
Eiji Masuda, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 10, 1988, Ser. No. 269,320

Claims priority, application Japan, Dec. 23, 1987, 62-323792

Int. Cl.[4] H03K *19/20;* **G06F** *7/38*

U.S. Cl. 307—451 **14 Claims**



1. A logical circuit for performing logical operations without a power supply, comprising:

(a) a transfer gate section having a first type MOS transistor, the gate electrode of which is connected to a first input terminal to which a first input signal having one polarity is applied, and a second type MOS transistor, the gate electrode of which is connected to a second input terminal to which a second input signal having the opposite polarity is applied, the source electrodes of the first and second MOS transistors connected in parallel with each other being connected to a third input terminal to which a third input signal is applied, and the drain electrodes of the first and second MOS transistors connected in parallel being connected to an output terminal, and

(b) a second type MOS switching transistor, the gate electrode of which is connected to the first input terminal, the remaining electrodes of the MOS switching transistor being connected to the output terminal and the second input terminal,

whereby logical operation of the two input signals applied to the second and third input terminals is performed.

4,893,032

NON-SATURATING TEMPERATURE INDEPENDENT VOLTAGE OUTPUT DRIVER WITH ADJUSTABLE DOWN LEVEL

James J. Braden, Endicott, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 28,992, Mar. 23, 1987, abandoned. This application Jun. 20, 1989, Ser. No. 368,971

Int. Cl.[4] H03K *19/088, 19/013*

U.S. Cl. 307—456 **3 Claims**

1. A non-saturating output driver circuit comprising:

a supply voltage source;

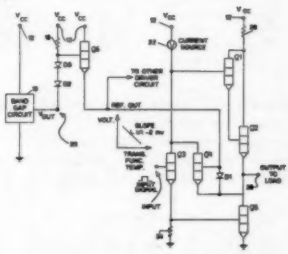
a supply voltage return;

a resistor having one end coupled to the supply voltage return;

an input transistor having first and second primary terminals and a control terminal, the first primary terminal being coupled to the supply voltage source, the second primary terminal being coupled to the other end of the resistor and the control terminal receiving an input signal;

an output transistor having first and second primary terminals and a control terminal, the first primary terminal supplying an output signal to a load, the second primary terminal being coupled to the supply voltage return and the control terminal being coupled to the second primary terminal of the input transistor;

a temperature compensation voltage reference circuit having an output terminal for supplying a reference voltage which varies in a predetermined manner with temperature;



and a saturation control diode mechanism having first and second primary terminals, the first primary terminal being coupled to the output terminal of the temperature compensation voltage reference circuit and the second primary terminal being coupled to the first primary terminal of the output transistor;

whereby the saturation control diode mechanism functions to minimize saturation of the output transistor and the temperature compensation voltage reference circuit functions to minimize temperature produced variations in down-level voltage at the first primary terminal of the output transistor.

4,893,033

PROGRAMMABLE LOGIC ARRAY HAVING INPUT TRANSITION DETECTION FOR GENERATING PRECHARGE

Kiyoshi Itano, 477-102, Shimokodanaka, Nakahara-ku, Kawasaki-shi, Kanagawa, 211, and Kohji Shimbayashi, 979, Kamikodanaka, Nakahara-ku, Kawasaki-shi, Kanagawa, 211 both of Japan

Filed Oct. 5, 1988, Ser. No. 253,515

Claims priority, application Japan, Oct. 6, 1987, 62-251980

Int. Cl.[4] H03K *17/04, 19/017*

U.S. Cl. 307—465 **13 Claims**

1. A programmable logic array circuit comprising:

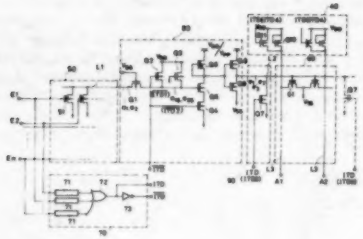
an AND array comprising a plurality of memory cells connected to input lines and product term lines, input signals being supplied to the AND array through the input lines;

an OR array comprising a plurality of memory cells connected to OR array input lines and OR array output lines, output signals being extracted through the OR array output lines;

pulse signal generating means for generating a pulse signal by detecting a change in levels of the input signals;

product term sensing buffer means for sensing levels of the product term lines, sensed levels being sent to the OR array through the OR array input lines,

the product term sensing buffer means comprising first precharging means for charging the product term lines up to a predetermined potential in response to the pulse signal derived from the pulse signal generating means, and discharging means for discharging the OR array input lines



in response to the pulse signal derived from the pulse signal generating means; and

second precharging means for charging the OR array input lines up to a predetermined potential in response to the pulse signal derived from the pulse signal generating means.

4,893,034

STOP/RESTART LATCH

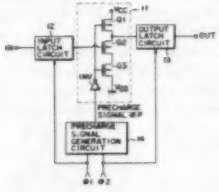
Kiichiro Tamaru, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 16, 1988, Ser. No. 155,822

Claims priority, application Japan, Feb. 19, 1987, 62-36730

Int. Cl.[4] H03K *17/16, 19/02, 3/284*

U.S. Cl. 307—480 **6 Claims**



1. A logic circuit for converting an input signal to a logic output signal, comprising:

a precharge signal generator driven by first and second clock signals to generate a precharge signal, said precharge signal being in a first level during a period ranging from an instant that the first clock signal changes from the first level to a second level until the second clock signal changes from a first level to a second level, said precharge signal being in the second level during the remaining periods;

first latch circuit means receiving the input signal and being driven by said first clock signal for latching the input signal when the first clock signal is changed from the second level to the first level;

a logic gate controlled by said precharge signal of said precharge signal generator, said logic gate being placed in a precharge mode when said precharge signal is in the second level and being placed in an operation mode when said precharge signal is in the first level, said logic gate producing a logic signal in response to a signal output from said first latch circuit; and

second latch circuit means driven by said second clock signal for latching the logic signal output from said logic gate when said second clock signal changes from the second level to the first level.

4,893,035

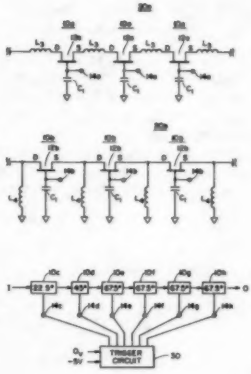
CASCADED LOW PASS/HIGH PASS FILTER PHASE SHIFTER SYSTEM

Leonard D. Reynolds, Jamaica Plain, and Yalcin Ayasli, Lexington, both of Mass., assignors to Hittite Microwave Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 220,737, Jul. 18, 1988. This application Sep. 26, 1988, Ser. No. 248,587

Int. Cl.[4] H03B *19/14;* **H03H** *7/10;* **H03J** *3/26;* **H03K** *17/687*

U.S. Cl. 307—520 **8 Claims**



1. A cascaded low pass/high pass filter phase shifter system comprising:

a series of semiconductor switches each having a control electrode and first and second load electrodes;

a capacitance connected in series between each said control electrode and ground;

an inductance connected in series between each second load electrode of one semiconductor switch and the first load electrode of the adjacent semiconductor switch in the series;

means for selectively applying a control signal to each said control electrode for switching the associated semiconductor switch between a first state in which it operates as a low pass filter and a second state in which it operates as a high pass filter to introduce a phase shift in a propagated signal.

4,893,036

DIFFERENTIAL SIGNAL DELAY CIRCUIT

Richard E. Hester, Eden Prairie, Minn., and Jerry R. Wahl, Woodland Park, Colo., assignors to VTC Incorporated, Bloomington, Minn.

Filed Aug. 15, 1988, Ser. No. 232,285

Int. Cl.[4] H03K *5/13*

U.S. Cl. 307—603 **11 Claims**

1. A phase transition delay circuit for a differential signal with a primary phase and a complementary phase, the delay circuit comprising:

primary phase and complementary phase input terminals for receiving the differential signal;

a primary node and a complementary node;

a first voltage controlled current source connected to the primary node;

a second voltage controlled current source connected to the complementary node;

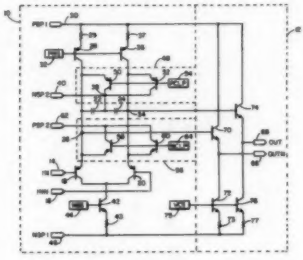
first capacitive means connected to the primary node;

second capacitive means of substantially the same capacitance of as the first capacitive means connected to the complementary node;

means coupled to the primary and complementary nodes for clamping the maximum voltage levels thereon at a predetermined level;

means coupled to the primary and complementary nodes for clamping the minimum voltage levels thereon at a predetermined level;

a voltage controlled current sink; and



comparator means connected to the input terminals for connecting the complementary node to the current sink when the primary phase is more positive than the complementary phase and for connecting the primary node to the current sink when the complementary phase is more positive than the primary phase;

wherein the first and second voltage controlled current sources provide current at substantially the same rate and wherein the current sink sinks a current having a magnitude substantially equal to the sum of the currents from the first and second voltage controlled current sources.

4,893,037

MOTOR-DRIVEN CABLE REEL ASSEMBLY

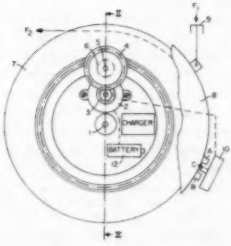
Östen Schwartz, Värmdö, Sweden, assignor to AB Electrolux, Stockholm, Sweden

Filed Apr. 18, 1988, Ser. No. 182,893

Claims priority, application Sweden, Apr. 28, 1987, 8701749

Int. Cl.[4] A47L *9/25;* **H02G** *11/02;* **H01R** *13/60;* **H02K** *7/12*

U.S. Cl. 310—68 B **6 Claims**



1. In a motor-driven cable reel assembly comprising a rotatable drum for winding thereon an electric cable, an electric motor operatively connected to said drum for rotating said drum in a cable reel-in direction, a storage battery connected to said motor for supplying power thereto, a battery charger connected to said cable for recharging said battery when said cable is connected to a source of current, the improvement comprising:

said drum including a rotatable side wall;

motor control switch means, operatively connected to said motor and operable to actuate said motor to rotate said drum in said reel-in direction, during which said motor generates torque, for switching-off said motor in response to generation thereby of a predetermined said torque, said switch means being actuated by rotation of said side wall to switch on and off said motor in response to the direction of rotation of said side wall.

4,893,038

DEVICE FOR LIMITING DIRECTION OF ROTATION OF SYNCHRONOUS MOTOR

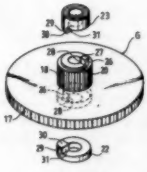
Yukimori Miyzawa, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Mar. 9, 1989, Ser. No. 321,126

Claims priority, application Japan, Mar. 10, 1988, 63-32016[U]

Int. Cl.[4] H02K *7/10, 19/00;* **F16D** *63/00;* **F16H** *57/10*

U.S. Cl. 310—83 **13 Claims**



1. A device for limiting the direction of rotation of a synchronous motor comprising:

(a) a gear drivingly rotated by a rotor of the motor for being rotated;

(b) a shaft supported to a casing for rotatable supporting said gear in such a manner that said gear is movable in an axial direction of said shaft;

(c) a pair of fixed members fixed to a casing and supporting said shaft, said gear being interposed between said pair of fixed members, one of said fixed members having a first engaging portion on a surface thereof facing said gear; and

(d) a first projection integrally formed on a surface of said gear facing said one fixed member, said projection being engageable with said engaging portion when said gear is rotated;

(e) said projection being engageable with said engaging portion to move said gear in the axial direction of said shaft to allow the rotation of said gear when the rotor is rotated in a normal direction, said projection being brought into abutting engagement with said engaging portion to prevent the rotation of said gear when said rotor is rotated in a reverse direction.

4,893,039

WINDSHIELD WIPER MOTOR

Yosinori Isii, Kanagawa, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 10, 1988, Ser. No. 204,806

Claims priority, application Japan, Jun. 12, 1987, 62-89606[U]

Int. Cl.[4] H02K *5/00*

U.S. Cl. 310—89 **2 Claims**

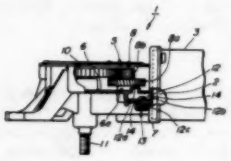
1. A windshield wiper motor assembly comprising a motor casing having motor means therein,

a gear casing connected to said motor casing and having reduction gear means therein operatively connected to said motor means,

a crooked air passage extending between said motor casing and said gear casing with an opening at each end thereof in communication with each casing and

breather means located in said passage to provide communication between said passage and the atmosphere outside of

said casings, wherein said breather means is provided with a hole offset from said openings at opposite ends of said passage in a position preventing straight line communication between said openings and said hole and includes a



substantially T-shaped member having a leg portion and a cap portion with said leg portion disposed in said hole and having at least one groove extending along the length thereof.

4,893,040

DYNAMO-ELECTRIC MACHINES

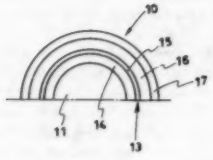
Alan B. Turner; Toshiyuki Kondo, and Katsuhiro Mori, all of East Sussex, United Kingdom, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

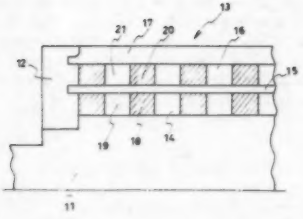
Filed May 5, 1988, Ser. No. 190,386

Claims priority, application United Kingdom, May 8, 1987, 8710991; May 8, 1987, 8710989; May 8, 1987, 8710990; May 14, 1987, 8711389

Int. Cl.[4] H02K *21/12*

U.S. Cl. 310—156 **18 Claims**





1. A rotating part for a dynamo-electric machine, comprising:

a core portion of magnetic material;

an annular permanent magnet surrounding said core portion, said annular permanent magnet includes a plurality of annular permanent magnet rings separated axially by nonmagnetic rings;

an annular retaining ring of magnetic material for securing the annular permanent magnet; and

a side wall made of a nonmagnetic material adjacent said annular permanent magnet.

4,893,041

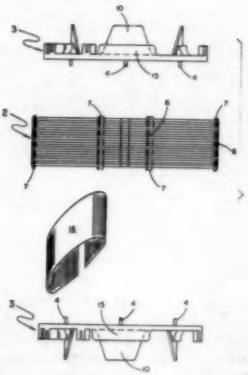
STATOR END CAP INSULATOR ASSEMBLY INCLUDING AN IMPROVED STATOR LINER, STATOR LINER RETAINER AND SHADING ELEMENT INSULATOR

S. Duke Snider; L. Ranney Dobogne, and Patrick K. Murphy, all of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 27, 1988, Ser. No. 263,615

Int. Cl.[4] H02K *3/34*

U.S. Cl. 310—215 **6 Claims**



1. An improved stator end wire insulation assembly for a stator core having a central axis with pole pieces having solid end face portions, circumferentially spaced about said central axis of said stator core separated by core openings extending through said core with magnet wires wound around each pole to extend through adjacent core openings on opposite side flanks of each pole to provide end turns adjacent said solid end face portions comprising:

separate and independent insulating liner means for each of said core openings formed into a shape corresponding to and only covering the surround wall defining each of said core openings; and

molded end cap insulator structure for attachment to opposite end faces of said core including a pair of plates having solid portions and formed into a shape corresponding to said solid end face portions of said core and including spaced openings aligned with said spaced openings in said core separated by said solid portions to overlie said solid end face portions of said pole pieces, said plates including liner restraining means cooperative with said insulating liner means of each opening to restrain both radial and axial movement of said liner means within its opening to maintain said liner means in flush relation with the surrounding wall defining said opening.

4,893,042

ROTOR FOR DC MOTOR

Toshinori Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,593

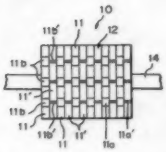
Claims priority, application Japan, Mar. 12, 1987, 62-59144; Mar. 12, 1987, 62-37725[U]

Int. Cl.[4] H02K *1/00*

U.S. Cl. 310—216 **11 Claims**

1. A rotor for a DC motor comprising an axial lamination of core sheets each having a plurality of radially and inwardly extended slits, said slits having an open portion at the circumferential periphery of said core sheets, said core sheets aligned so that said slits in said core sheets, when the core sheets are

axially laminated, define longitudinal grooves in said lamination at the circumferential periphery of said core sheets which form said lamination, and armature coils wound around said lamination through said grooves, characterized in that said core sheets are at least partially formed of electromagnetic steel plate, and a soft iron member is provided for partially closing the said open portion of said grooves defined by said



aligned slits in said lamination, said soft iron member being a cylindrical unit having a plurality of slots that extend longitudinally thereof, said cylindrical unit receiving said lamination therein, said plurality of superimposed over corresponding grooves in said lamination, and dimensioned to circumferentially and partially close the open portions of said grooves at the circumferential periphery of said core sheets which form said lamination.

4,893,043

BRUSH PROTECTION IN AN ELECTRIC MOTOR

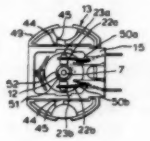
Roger F. Baines, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory Limited, Chaiwan, Hong Kong

Filed Feb. 16, 1988, Ser. No. 155,705

Claims priority, application United Kingdom, Feb. 16, 1987, 8703527

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 **4 Claims**



1. A PMDC motor having a commutator and a pair of brushleaves each carrying a brush, each leaf biassing its respective brush against the commutator to make electrical contact therewith, wherein an abutment-type stop is provided for at least one of the brushleaves the stop being located to engage said one of the brushleaves so as to limit movement of said one of the brushleaves toward the commutator and prevent electrical shorting between the brushleaves wherein the motor includes an end cap, wherein the end cap comprises a bearing support portion and a holder slidably received in the bearing support portion, the brushleaves being mounted in the holder and wherein the stop is integrally formed on the holder.

4,893,044

ROTOR BALANCING

James W. Bush, and Gary J. Anderson, both of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Nov. 20, 1987, Ser. No. 123,333

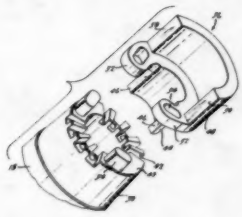
Int. Cl.[4] H02K *1/22*

U.S. Cl. 310—261 **6 Claims**

1. A counterweight for a rotor of a dynamoelectric motor comprising:

a main body portion of substantial mass, said main body portion being generally of a shape so as to extend generally circumferentially along an end face of a rotor through an arc of up to but not exceeding 180° f said end face; and

mounting means extending outwardly from opposite ends of said main body portion so as to extend generally circumferentially along said end face of said rotor,



said mounting means and said main body being of a length so as to extend in excess of 180° around said circumference of said rotor when assembled thereto;

said main body portion of said counterweight being stepped and including a C-shaped inner section sized to fit within a bore provided in said end surface of said rotor and a C-shaped outer section extending axially outwardly from said end surface of said rotor.

4,893,045

ULTRASONIC DRIVING DEVICE

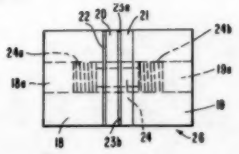
Keisuke Honda, Aichi, Japan, assignor to Honda Electronic Co., Ltd., Aichi, Japan

Filed Jul. 13, 1988, Ser. No. 218,656

Claims priority, application Japan, Jul. 14, 1987, 62-176911; Sep. 12, 1987, 62-228799

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **24 Claims**



1. An ultrasonic driving device comprising:

a stator having two metal blocks,

at least one piezoelectric vibrator,

two electrodes, one electrode being divided in two parts,

said electrodes and said at least one vibrator being positioned between said two metal blocks,

a bolt for fixing the metal blocks, the at least one piezoelectric vibrator and said two electrodes by means of threads on said bolt extending to both sides of the metal blocks,

a member to be driven on an end portion or side portion of the stator, and

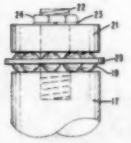
a single AC voltage supply means for driving only one said part of said divided electrode, said AC voltage supply means supplying an AC voltage only to said one said part and to the other electrode.

4,893,046

ULTRASONIC DRIVING DEVICE

Keisuke Honda, Aichi, Japan, assignor to Honda Electronic Co., Ltd., Aichi, Japan

Filed Sep. 8, 1988, Ser. No. 241,602
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 9 Claims



1. An ultrasonic driving device comprising

(a) disk-type rotary means for rotating a rotary machine element, said rotary means including means for rotatably holding a plurality of rolling means with the rolling means being exposed at opposite surfaces of the rotary means;

(b) a stator means for producing a progressive wave, said stator means being in contact with the rolling means extending from one surface of the rotary means;

(c) pressure means for pressing the rolling means of the rotary means to the stator means, said pressure means being in contact with the rolling means extending from the opposite surface of the rotary means; and

(d) fixing means for fixing the rolling means of the rotary means between the pressure means and the stator means;

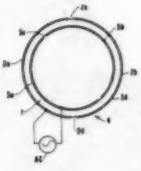
whereby movement of the rolling means with the progressive wave on the stator means causes rotation of the rotary means.

4,893,047

ULTRASONIC DRIVING DEVICE

Keisuke Honda, Aichi, Japan, assignor to Honda Electronic Co., Ltd., Aichi, Japan

Filed Sep. 14, 1988, Ser. No. 244,917
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 8 Claims



1. An ultrasonic driving device comprising:

a stator including a cylindrical piezoelectric vibrator;

inner divided electrodes secured to an inside portion of the cylindrical piezoelectric vibrator, with first gaps therebetween

outer divided electrodes secured to an outside portion of the cylindrical piezoelectric vibrator, with second gaps therebetween;

said first and second gaps being shifted from each other;

an alternating current (AC) power supply connected to respective ones of the divided electrodes on the inside and outside portions of the cylindrical piezoelectric vibrator; and

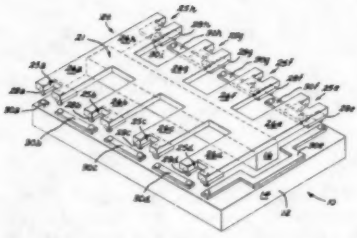
a rotary member combined with an end or side portion of the stator.

4,893,048

MULTI-GAP SWITCH

George A. Farrall, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,623
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—331 21 Claims



1. A switch comprising:

a first and second main terminals;

more than two contact pairs connected in series between said first and second main terminals, each of said contact pairs including a movable contact and having an open position and a closed position, said first main terminal being connected to said second main terminal by said switch if only if all of said contact pairs in said series connection are in their closed position, said contact pairs comprising a contact material which develops a contact voltage X in the presence of an arc, said series connection of contact pairs including at least $V_P/2X$ contact pairs where V_P is the peak voltage said switch is rated to turn off; and

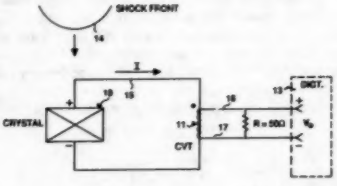
means for actuating said contact pairs between their respective open and closed positions.

4,893,049

LITHIUM NIOBATE EXPLOSION MONITOR

Charles H. Bundy, Clearwater, Fla.; Robert A. Graham, Los Lunas, N. Mex.; Stephen F. Kuehn, Albuquerque, N. Mex.; Richard R. Precit, Albuquerque, N. Mex., and Michael S. Rogers, Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 29, 1986, Ser. No. 868,375
The portion of the term of this patent subsequent to Dec. 9, 2004, has been disclaimed.
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—338 9 Claims



1. An explosive monitor including:

means for providing an electrical output indicative of the detonation of an explosive material, said means comprising:

a lithium niobate crystal wafer having spaced parallel faces cut substantially perpendicular to a unique polar axis "z"; and

first means for detecting a piezoelectric current output of said crystal indicative of the detonation of an explosive material; and

checking means for nondestructively checking the responsiveness of said crystal prior to detonation of the explosive material, said checking means comprising:

second means for controllably heating said crystal; and

third means for detecting a pyroelectric charge output of said crystal responsive to the heating of said crystal by said second means.

4,893,050

LAMP WITH A CAPTURED REFLECTOR AND METHOD OF MANUFACTURE

Larry R. Fields, Richmond, Ky., assignor to GTE Products Corporation, Danvers, Mass.

Filed Aug. 22, 1988, Ser. No. 234,983
Int. Cl.[4] H01K *1/36, 3/12*
U.S. Cl. 313—113 **18 Claims**

1. A press sealed incandescent electric lamp with a captured reflector comprising:

(a) a radiant energy transmissive envelope having an inner surface defining an enclosed volume, and a press seal portion,

(b) an incandescent filament structure to generate radiant energy positioned in the enclosed volume, and having electrical leads passing through the press seal portion, and

(c) a reflector, having a reflective surface positioned in the enclosed volume, opposite the filament structure to reflect radiant energy generated by the filament, including a support projection captured in the inner surface of the press seal.

4,893,051

SPARK PLUG AND THE METHOD OF MANUFACTURING THE SAME

Ryoji Kondo, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 372,148, Apr. 27, 1982, abandoned.
This application Mar. 18, 1985, Ser. No. 712,917
Claims priority, application Japan, May 7, 1981, 56-66725
Int. Cl.[4] H01T *13/20*
U.S. Cl. 313—141 **11 Claims**

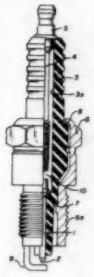
1. A spark plug for internal combustion engines comprising:

a ground electrode made of an electrically conductive base metal;

a center electrode made of an electrically conductive base metal and provided with a noble metal tip only on a flat end of a tapered end portion thereof, said noble metal tip facing said ground electrode through an air gap said noble metal tip being completely resistance welded under mechanical pressure to said electrically conductive base metal to provide a strong bond therebetween; and

an insulator securely encasing said center electrode and electrically insulating said center electrode from said ground electrode, wherein said noble metal tip is made of a platinum alloy consisting essentially of 70–80 percent platinum, by weight, and 30–20 percent iridium, by weight, and wherein said center electrode is manufactured by the steps of:

preparing the base metal of said central electrode having a uniform diameter;



welding said noble metal tip to the top end surface of said center electrode; and

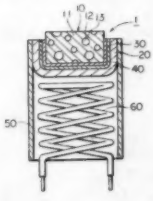
shaping said center electrode to provide said flat end of said tapered end portion to be smaller in diameter than said center electrode axially beyond said tapered end portion.

4,893,052

CATHODE STRUCTURE INCORPORATING AN IMPREGNATED SUBSTRATE

Hideo Tanabe, and Mamoru Tsuzurahara, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 14, 1987, Ser. No. 3,325
Claims priority, application Japan, Mar. 14, 1986, 61-54784
Int. Cl.[4] H01J *1/14, 19/06*
U.S. Cl. 313—346 R **20 Claims**



12. A cathode structure comprising:

a substrate comprising a porous sinter made of high melting point metal impregnated with an electron emitting material;

a metal supporting sleeve for supporting said substrate;

a metal cup shaped to receive said substrate therein secured to said metal supporting sleeve;

a layer of solder provided between said substrate and said metal cup for bonding said substrate within said metal cup; and

a covering layer provided between said substrate and said layer of solder, said covering layer being made of a metal having a melting point higher than a melting point of said solder, wherein said covering layer is arranged so as to prevent said solder from permeating into said substrate.

4,893,053

COLOR DISPLAY TUBE WITH CHANNEL ELECTRON MULTIPLIER MEANS

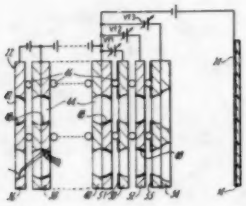
Alan G. Knapp, Crawley, and John R. Mansell, East Grinstead, both of United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 625,398, Jun. 28, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,790

Claims priority, application United Kingdom, Jul. 8, 1983, 8318493

Int. Cl.[4] H01J 29/80, 29/46

U.S. Cl. 313—400 8 Claims



1. A color display tube comprising an envelope including a faceplate, said envelope containing:

(a) means for producing an electron beam;

(b) electron multiplier means including a multiplicity of channels having respective input ends and output ends and containing secondary emissive material along the lengths thereof, said output ends being disposed opposite the faceplate at a predetermined distance therefrom;

(c) scanning means for scanning the electron beam across the input ends of the channels;

(d) a screen comprising a pattern of dots and surrounding rings of luminescent materials disposed on the faceplate for impingement by electrons from respective ones of the channels; and

(e) output electrode means disposed between the electron multiplier means and the screen and having apertures aligned with corresponding ones of the output ends of said channels, said output electrode means in response to the application of predetermined voltages thereto controlling both the focusing of the electrons into beams and the distance from the center of each dot and ring to the source where the electrons focused into the corresponding electron beam last strike secondary emissive material, thereby controlling the shapes and widths of the electron beams where they impinge on the screen.

4,893,054

SHADOW MASK TYPE COLOR CATHODE RAY TUBE

Hiroo Kobayashi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,702

Claims priority, application Japan, Mar. 3, 1987, 62-49411; Mar. 10, 1987, 62-55911

Int. Cl.[4] H01J 29/81

U.S. Cl. 313—408 4 Claims

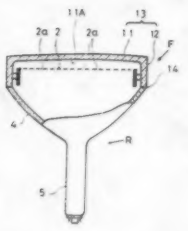
1. A color cathode ray tube, comprising:

a face panel including a faceplate having a flat outer surface and a curved inner surface, and a phosphor screen formed of a pattern of triads of phosphor dots on said curved inner surface;

a color selecting shadow mask carried by said face panel so as to confront, and be spaced a predetermined distance inwardly from the phosphor screen, said shadow mask being held flat under tension and having a pattern of apertures defined therein for the passage of electron beams therethrough towards the phosphor screen;

said curved inner surface of said faceplate further being curved to have first, second and third radii of curvature in diagonal, widthwise and heightwise directions, respectively, said first radius of curvature being of the greatest value, said third radius of curvature being of the smallest value, and said second radius of curvature being of a value generally intermediate the value of said first and third radii of curvature; and

the pitch between each neighboring aperture in the shadow mask decreasing progressively away from the center of



the faceplate towards a peripheral region of said faceplate while satisfying a condition wherein the pitch is chosen, in reference to the interval of the phosphor dots on the phosphor screen in the horizontal scanning direction on a plane perpendicular to the axis of the color cathode ray tube, to have a value equal to or greater than 80% of the pitch at a position corresponding to the center of the faceplate.

4,893,055

PROCESS FOR USING UNSATURATED POLYESTER RESIN COMPOSITION FOR TREATING CATHODE-RAY TUBES AND CATHODE TUBES OBTAINED THEREBY

Tadashi Fuzii, Hitachi; Hirohumi Izumi, Kitaibaraki; Etsuji Iwami, and Kazuyuki Tanaka, both of Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 817,668, Jan. 10, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 118,160

Claims priority, application Japan, Jan. 22, 1985, 60-10686; Jan. 24, 1985, 60-11278

Int. Cl.[4] H01J 29/88, 29/87

U.S. Cl. 313—479 12 Claims

1. A cathode-ray tube obtained by casting a resin composition for treating cathode-ray tubes exhibiting excellent adhesive strength and freedom from cure distortion into a gap between a front glass and a face-plate portion of a cathode-ray tube and curing the resin composition, said resin composition comprising:

0.5 to 10 parts by weight of maleic anhydride admixed with 100 parts by weight of an unsaturated polyester resin composition comprising

(I) an unsaturated polyester obtained by reacting an acid component comprising as an essential constituent at least one member selected from the group consisting of an unsaturated dibasic acid and an acid anhydride thereof, with an alcohol component and having a molecular weight of 500 to 8,000 per unsaturated group,

(II) at least one member selected from the group consisting of a styrene monomer and a derivative thereof, and

(III) at least one polymerizable unsaturated compound selected from the group consisting of

(i) acrylonitrile, itaconic acid and citraconic anhydride,

(ii) a monoester and a diester of unsaturated diabasic acid, and

(iii) acrylic acid, methacrylic acid and a derivative thereof;

the component (I) being dissolved in the components (II) and (III) in the range of

$(b)/\{(a)+(c)\} = 1/10$ to $10/1$,

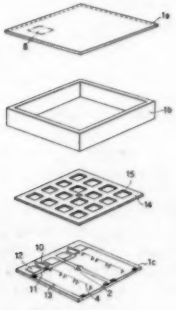
wherein (a) is the number of unsaturated groups in the component (I); (b) is the number of unsaturated groups in the component (II); and (c) is the number of unsaturated groups in the component (III).

4,893,056

FLUORESCENT DISPLAY APPARATUS

Zenichiro Hara, Nagasaki; Masaaki Kobayashi; Kazunori Tatsuda, both of Mie; Nobuo Terazaki, and Shuji Iwata, both of Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda and Ise Electronics Corporation, Ise, both of, Japan

Filed Oct. 12, 1988, Ser. No. 256,616
Claims priority, application Japan, Oct. 12, 1987, 62-256610
Int. Cl.[4] H01S *29/74*
U.S. Cl. 313—495 6 Claims



1. In a fluorescent display apparatus consisting of a vacuum chamber containing cathodes for emitting thermoelectrons, control electrodes for controlling the flow of the emitted thermoelectrons, and a display portion formed of a plurality of fluorescent display portions coated with fluorescent material and emitting light upon being bombarded by the thermoelectrons, said fluorescent display apparatus wherein

said display portion is formed of said fluorescent display portions arranged in a matrix of 2 m rows by n columns (m, n are natural numbers),

said cathodes are made up of cathodes in a linear form oriented in the direction of the row or column and disposed to oppose said display portion arranged in an array of m rows by n columns so that one each thereof corresponds to two of said fluorescent display portions, and

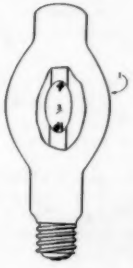
said control electrodes are made up of a first control electrode in a planar form disposed between said display portion and said cathodes and having openings made therein corresponding to said fluorescent display portions of said display portion, second control electrodes disposed on the side of said cathodes opposite to said display portion and arranged in an array of m rows by n columns so that each thereof are disposed corresponding to each said cathode, and third control electrodes disposed on both sides of said second control electrodes in the direction of the column arranged in an array of 2 m rows by n columns.

4,893,057

HIGH INTENSITY DISCHARGE LAMP AND ELECTODES FOR SUCH A LAMP

Nancy J. Tillman nee Caruso, Perry, and Philip J. Nalepa, Painted Post, both of N.Y., assignors to North American Philips Corp., New York, N.Y.

Continuation-in-part of Ser. No. 493,175, May 10, 1983, abandoned. This application Nov. 18, 1985, Ser. No. 799,273
Int. Cl.[4] H01J *61/073*
U.S. Cl. 313—631 4 Claims



1. A high intensity discharge lamp comprising

an arc tube enclosing a space,

an ionizable material contained in said space,

at least two electrodes each extending to a tip, and arranged in said space for establishment of an arch between said tips, and

means for connecting said electrodes to a source of electric current,

characterized in that said electrodes each are all metallic and consist essentially of a length of wire having a straight tip end and a connection end, a first portion of said length adjoining said straight tip end and a second portion of said length adjoining said connection end, each portion being a straight portion, and said portions extending generally parallel to each other, arranged such that in normal operation the arc extends between said straight tip ends,

between said first portion and said second portion said length comprises a third portion formed as a helical coil having a plurality of closely spaced turns, said turns defining crevices arranged to permit easy lamp starting by initiation of an arc at one of the crevices, and subsequent transfer of the arc to the tip,

said wire has circular cross-section, and said coil has an inside diameter greater than the diameter of the wire,

the coil axis is skewed with respect to said straight tip and connection ends, and

said electrodes each further comprises a core slug comprising a metallic cylinder having a length approximately equal to the length of said coil, about which core slug said coil fits snugly.

4,893,058

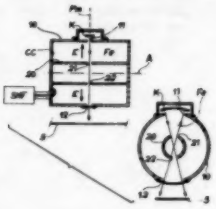
ARRAY ELECTRON ACCELERATOR

Jean-Pierre Gueguen, Chevilly Larue; Annick N'Guyen, Bures sur Yvette, and Jacques Pottier, Orsay, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 20, 1988, Ser. No. 196,424
Claims priority, application France, May 26, 1987, 87 07379
Int. Cl.[4] H01J *25/02*
U.S. Cl. 315—5 3 Claims

1. Array electron accelerator, incorporating a linear cathode (K) emitting an electron beam (Fe) in the form of an array, an accelerating structure where there is an electric field (E) directed into the plane of the array, characterized in that the accelerating structure is a coaxial cavity (CC) constituted by

an external cylindrical conductor (10) and an internal cylindrical conductor (20) having the same axis (A), said cavity being excited by a high frequecy source (SHF) to the resonant frequency of the fundamental mode and in that the cathode (K) is contained in the median plane (Pm) of the cavity perpendicular



to the axis, the electron beam (Fe) emitted by the cathode (K) being injected into the cavity in said median plane, the external (10) and internal (20) cylinders having circular arc-like openings (11,12,21,22) centered on the axis of the cavity for the passage of the beam (Fe).

4,893,059

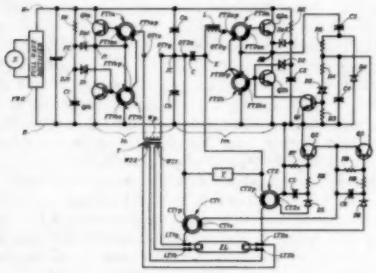
ELECTRONIC BALLAST WITH SAFETY FEATURE

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Feb. 19, 1986, Ser. No. 830,739

Int. Cl.[4] H05B *44/14*

U.S. Cl. 315—127 **16 Claims**



1. A ballast for a fluorescent lamp, comprising:

source means: (i) having control input means receptive of a control signal, (ii) being controllably operable to provide a current-limited output voltage between a pair of output terminals, (iii) being adapted to exist in either of two modes of operation: a first mode in which the output voltage consists of brief periods of relatively high-magnitude voltage interrupted with short periods of relatively low-magnitude voltage and a second mode in which the output voltage consists of a substantially constant-magnitude voltage, and (iv) being operative to exist in the second mode only if a control signal is supplied to the control input means;

lamp connect means operative to permit connection of a fluorescent lamp between the pair of output terminals; and

control means connected in circuit with the output terminals and the control input means, the control means being responsive to current flowing from the output terminals and operative to provide a control signal to the control input means as long as current is indeed flowing from both output terminals;

whereby, if current is prevented from flowing from at least one of the output terminals, no control signal is provided and the source means will then exist in its first mode of operation.

4,893,060

DRIVE CIRCUIT FOR A THIN-FILM ELECTROLUMINESCENT DISPLAY PANEL

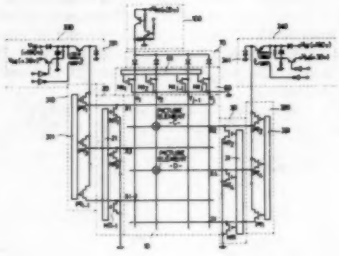
Toshihiro Obba; Yoshiharu Kanatani, both of Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 664,958, Oct. 26, 1984, abandoned. This application Apr. 25, 1988, Ser. No. 186,743

Claims priority, application Japan, Oct. 31, 1983, 58-206514

Int. Cl.[4] H01J *19/14*

U.S. Cl. 315—169.3 **16 Claims**



1. A drive circuit for a thin-film electroluminescent (EL) matrix display panel comprising:

data side electrodes formed on one major surface of the thin-film electroluminescent (EL) matrix display panel in one direction;

scanning side electrodes formed on the opposing major surface of said thin-film electroluminescent (EL) matrix display panel in another direction substantially perpendicular to said data side electrodes, said scanning side electrodes being alternately divided into odd number scanning electrodes and even number scanning electrodes;

an odd side write driving circuit supplying a writing pulse to selected even number scanning electrodes in a first drive field and to selected odd number scanning electrodes in a second drive field;

an even side write driving circuit supplying said writing pulse to said selected odd number scanning electrodes in said first drive field and to said selected even number scanning electrodes in said second drive field;

an odd side N-channel high voltage MOS driver connected to said odd number scanning electrodes at one end thereof, the other end of said odd side N-channel high voltage MOS driver being connected to a grounded terminal;

an odd side P-channel MOS high voltage driver connected to said odd number scanning electrodes at one end thereof, the other end of said odd side P-channel MOS high voltage driver being connected to said odd side write driving circuit;

an even side N-channel high voltage MOS driver connected to said even number scanning electrodes at one end thereof, the other end of said even side N-channel high voltage MOS driver being connected to the grounded terminal; and

an even side P-channel high voltage MOS driver connected to said even number scanning electrodes at one end thereof, the other end of said even side P-channel high voltage MOS driver being connected to said even side write driving circuit;

said writing pulse supplied in said first drive field being of

opposite polarity to said writing pulse supplied in said second drive field.

4,893,061

SWITCHING ARRANGEMENT

Henricus M. H. Linssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1988, Ser. No. 194,632

Claims priority, application Netherlands, Jun. 11, 1987, 8701358

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—227 R 4 Claims

1. A switching arrangement for ignition and operation with a stable discharge of at least one high-pressure discharge lamp comprising: at least two lamp connection points interconnected by a branch circuit comprising a capacitor and a switching element, a ballast impedance, means for connecting said ballast impedance in series circuit with said two lamp connection points to a pair of voltage supply terminals for the switching arrangement, and means connecting the capacitor to a charge voltage source via a charge circuit that excludes said ballast impedance, characterized in that the switching element is a gas-filled breakdown element.

4,893,062

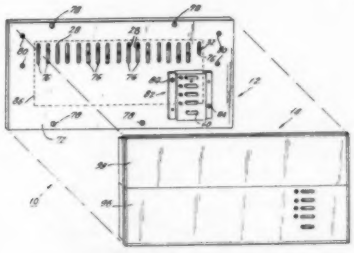
WALL BOX DIMMING SYSTEM AND FACE PLATE AND SWITCH ASSEMBLY THEREFOR

Michael J. D'Aleo, Ottsville, and Joel S. Spira, Coopersburg, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Apr. 21, 1987, Ser. No. 40,646

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—291 41 Claims



1. A dimming system assembly for controlling the intensity of m groups of lights, m being an integer, each group including one or more lights, said dimming system assembly comprising:

(A) an electronics module having dimmer electronics located therein for controlling the lighting level of said m groups of lights in accordance with a selected one of n preset scenes, n being an integer greater than 1, said dimmer electronics including:

(1) n groups of m slide potentiometers, each slide potentiometer of a given group controlling the intensity of a respective group of lights; and

(2) n switch means, each switch means being associated with a different said group of slide potentiometers for causing the intensity of said groups of lights to be determined by that group of slide potentiometers associated with the respective switch means; and

(B) a face plate assembly coupled to said electronics module, said face plate assembly comprising:

(1) a support plate having m×n slots formed therein, each of said slide potentiometers including slide arms extending into a respective said slot; said support plate including a coupling section having a cam surface and a locking surface which intersect at a ridge; said support plate also having at least one opening through which said switch means extend;

(2) a window pivotally coupled to said coupling section of said support plate by a pin and being pivotable about an axis of said pin between a closed position, wherein said window covers said slots and said slide arms of said potentiometers, and an open position, wherein said window exposes said slots and said slide arms of said potentiometers so that the position of said slide arms of said potentiometers may be adjusted by the operator of said dimming system assembly; an inner surface of said window sliding along said cam surface as said window moves from said closed position to said open position until it reaches said ridge and then contacting said locking surface after it moves past said ridge; and

(3) said coupling section, said window and said pin cooperating to cause said inner surface to be biased radially inward toward said axis of said pin in such a manner that said inner surface is first biased into contact with said cam surface and then is biased into locking engagement with said locking surface as said window is moved from said closed to said open position.

4,893,063

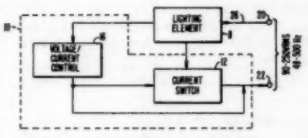
APPARATUS FOR IMPROVING THE EFFICIENCY OF A LIGHTING ELEMENT

Joseph Pernyeszi, 844 Weston Rd., Scotts Valley, Calif. 95066

Filed Oct. 6, 1987, Ser. No. 106,736

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—307 20 Claims



1. Apparatus for regulating the illumination of a lighting element connected to an alternating current voltage supply comprising:

voltage detecting means for detecting the AC voltage across a lighting element; and

voltage maintaining means, responsive to the voltage detecting means, for maintaining a prescribed voltage across the lighting element independently of the current flowing through the lighting element, the voltage maintaining means including initial voltage increasing means for gradually increasing the voltage across the lighting element when the lighting element is initially turned on.

4,893,064

OPERATING SYSTEM FOR SKIN TREATMENT APPARATUS

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Jul. 15, 1985, Ser. No. 754,982

Int. Cl.[4] H05B *41/00*

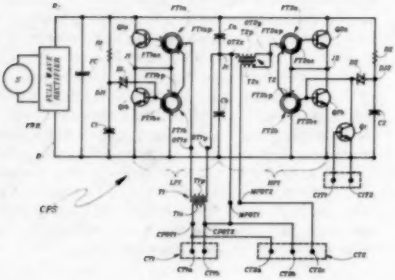
U.S. Cl. 315—317 20 Claims

1. In an operating system for a skin treatment apparatus, said system being adapted to be powered from an ordinary electric

utility power line and having a plurality of fluorescent lamp means, each such lamp means: (i) having a pair of thermionic cathodes, each cathode having a pair of input terminals, (ii) being operative to provide radiation suitable for beneficially affecting human skin exposed to this radiation, and (iii) requiring for proper operation that a relatively low-magnitude cathode voltage be applied across the input terminals of each cathode and that a relatively high-magnitude current-limited main voltage be applied between the two cathodes; the improvement comprising:

rectifier and filter means connected with said power line and operable to provide across a pair of DC terminals a DC voltage of substantially constant magnitude;

inverter means connected with said DC terminals and, in response to said DC voltage, operable to provide a first AC voltage at a first AC output and a second AC voltage at a second AC output;



for each lamp means, a lamp ballasting means operable: (i) whenever receiving said first AC voltage at a first set of input terminals, to provide therefrom said relatively low-magnitude cathode voltage, and (ii) whenever receiving said second AC voltage at a second set of input terminals, to provide therefrom said relatively high-magnitude current-limited main voltage; said lamp ballasting means comprising protection means whereby, if the lamp means does not start operation within a brief period after having been provided with said relatively high-magnitude current-limited main voltage, an effective short circuit is placed between the cathodes of said lamp means; and

distribution means connected with said first and second AC outputs and operative to provide said first AC voltage at said first set of input terminals and said second AC voltage at said second set of input terminals.

4,893,065

GEOMETRIC ERROR COMPENSATION CIRCUIT OF COLOR TELEVISION CAMERA DEVICES

Junichi Yamanaka, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

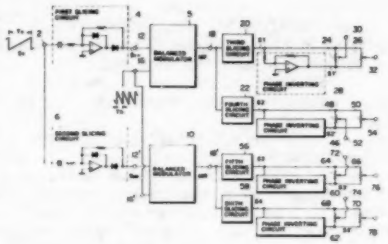
Continuation of Ser. No. 580,163, Feb. 14, 1987, abandoned. This application Sep. 16, 1987, Ser. No. 96,788
Claims priority, application Japan, Feb. 17, 1983, 58-23722
Int. Cl.[4] H01J *29/56*
U.S. Cl. 315—371 **7 Claims**

1. A geometric error compensation circuit of a color television camera device having means for generating vertical and horizontal scanning sawtooth shaped signals during respective vertical and horizontal scanning periods, said compensation circuit comprising:

a first separating circuit for separating said vertical scanning signal into a first signal and a second signal corresponding to fore and rear portions respectively of the vertical scanning period;

first and second balanced modulator circuits for effecting balanced modulations of said horizontal scanning signal in accordance with the separated first and second signals, respectively, to provide an output signal for each said first and second modulator circuits, each said output signal having symetrical positive and negative portions;

second and third separating circuits for separating the output signals of said first and second balanced modulation circuits into third and fourth output signals, and fifth and



sixth output signals, respectively, in accordance with reference levels of its respective said modulating circuit output signals; and

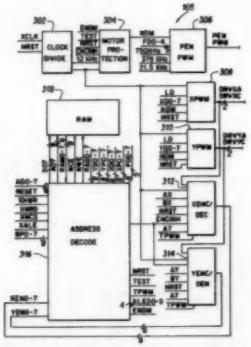
compensation signal forming circuits for forming geometric error compensation signals corresponding to specific portions of said horizontal and vertical scanning periods in accordance with said separated third through sixth signals.

4,893,066

HYBRID SAMPLE RATE SERVO MOTOR CONTROLLER

Lowell J. Stewart, Poway, and Alfred H. Mebane IV, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 19, 1988, Ser. No. 246,240
Int. Cl.[4] G05B *19/29*
U.S. Cl. 318—600 **18 Claims**



1. In a digital rate compensation servo controller for controlling a plant apparatus and employing a displacement indicator having a predetermined resolution and providing displacement signals indicative of displacement of said plant and which are integral multiples of said resolution, and further employing a rate compensation feedback loop for providing rate compensation signals to be combined with reference control signals, the magnitude of said compensation signals varying as a function of estimates of the plant velocity, said velocity estimates being dependent on said displacement signals, and wherein updated

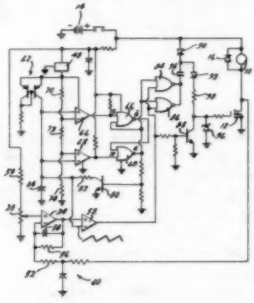
velocity estimates are provided under high velocity conditions at a first relatively high fixed sample rate, the improvement comprising means for modifying the rate at which non-zero velocity estimates are provided under low velocity conditions so that updated non-zero velocity estimates are provided only after said displacement signal has incremented by said predetermined resolution, thereby substantially reducing rate quantization error due to said displacement indicator resolution.

4,893,067

DIRECT CURRENT MOTOR SPEED CONTROL

Pradeep Bhagwat, Baltimore, Md.; Duronie Harrell, Charlotte; Stephen Smith, Raleigh, both of N.C., and Samuel G. Woods, Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.

Filed May 6, 1987, Ser. No. 47,181
Int. Cl.[4] G05B *5/00*
U.S. Cl. 388—817 **14 Claims**



1. A DC motor speed control circuit comprising:
a DC motor inducing a back EMF;
a sample and hold means coupled to said motor for developing a signal having a $1-\chi$ relationship to the back EMF of said motor where is χ the back EMF;
a means for measuring and comparing said developed signal with a predetermined reference signal indicative of the desired motor speed;
a means for producing a gating signal indicative of the relationship of said developed signal to said reference signal;
a gated control means coupled to regulate electrical power to said motor; said control means being responsive to said gating signal to permit power flow to said motor when said developed signal is at one relationship to said reference signal and to restrict power flow to said motor when said developed signal is at a second relationship to said reference signal.

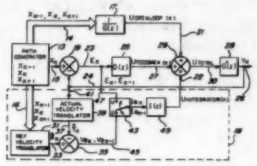
4,893,068

DIGITAL SERVO EMPLOYING SWITCH MODE LEAD/LAG INTEGRATOR

Daniel D. Evans, Jr., Oceanside, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 15, 1988, Ser. No. 271,477
Int. Cl.[4] G05B *5/01*
U.S. Cl. 318—615 **26 Claims**

1. Servo positioning apparatus for use in moving and holding a mechanical element comprising:
means for outputting a desired position signal representative of a desired position of said element;
means for generating a velocity error signal representing departure of the velocity of said element during movement from a desired velocity;
a feedback loop including means for generating a position error signal related to the difference between the actual position of said element and the desired position of said element represented by said desired position signal, said feedback loop further including means for applying a transfer function to said error signal to generate a feedback control signal; and
means receiving said position error signal as an input for generating an integrator error signal, said integrator error



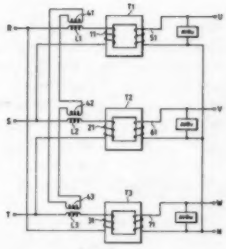
signal being determined in accordance with said velocity error signal during movement of said element and said position error signal during holding of said element, and for integrating said integrator error signal to generate an integrator control signal for combination with said feedback control signal.

4,893,069

FERRORESONANT THREE-PHASE CONSTANT AC VOLTAGE TRANSFORMER ARRANGEMENT WITH COMPENSATION FOR UNBALANCED LOADS

Kosuke Harada; Akihiko Katsuki, both of Fukuoka, and Fukutoshi Tominaga, Saga, all of Japan, assignors to Nishimu Electronics Industries Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 249,720, Sep. 7, 1988, abandoned. This application May 30, 1989, Ser. No. 358,476
Claims priority, application Japan, Jul. 29, 1988, 62-162142
Int. Cl.[4] G05F *1/13*
U.S. Cl. 323—215 **6 Claims**



1. A ferroresonant three-phase constant AC voltage transformer comprising:
three magnetically permeable transformer cores,
a primary side winding and a secondary side winding formed on each of said transformer cores,
three input terminals,
three input means each of which can be in an inductive coupling and each of which provides an inductive reactance effectively in series with a corresponding one of said primary side windings to thereby form three primary phase winding units each in a predetermined connection pattern to the three input terminals,

automatic voltage regulating means for controlling secondary side output voltages generated at the secondary side windings to a predetermined value,

three compensating windings each formed so as to be inductively coupled with a corresponding one of said input means, and

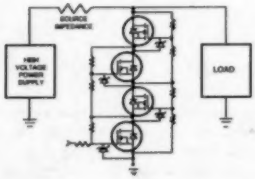
means for connecting said compensating windings to each other in series to form a series closed loop circuit.

4,893,070

DOMINO EFFECT SHUNT VOLTAGE REGULATOR

Walter E. Milberger, Severna Park; Charles S. Kerfoot, Pasadena, and Franklin B. Jones, Catonsville, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 28, 1989, Ser. No. 318,210
Int. Cl.[4] G05F *1/44*
U.S. Cl. 323—270 **4 Claims**



1. A shunt voltage regulator used with a high voltage power supply having a series source impedance feeding a load, wherein the shunt voltage regulator comprises an amplifier connected shunting the load;

wherein said amplifier comprises a plurality of stages in tandem from a first stage to an Nth stage, each stage being a three-terminal unit having an input terminal, an output terminal and a common terminal, input means coupled between the input and common terminals of the first stage, the input means being coupled to an external signal source to command operation of the first stage, the output terminal of the Nth stage being coupled to the load;

each stage after the first having its input terminal coupled to the common terminal of the preceding stage, and its common terminal coupled to the output terminal of the preceding stage;

each stage comprising an amplifying device having an inverting input, a non-inverting input and an output, a reference resistor connected between the input terminal of each stage and the non-inverting input of each amplifying device, a feedback resistor connected between the inverting input and the output of each amplifying device, the non-inverting input of each amplifying device being the common terminal of the stage, and the output of each amplifying device being the output terminal of each corresponding stage.

4,893,071

CAPACITIVE INCREMENTAL POSITION MEASUREMENT AND MOTION CONTROL

Gabriel L. Miller, Westfield, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 24, 1988, Ser. No. 197,800
Int. Cl.[4] G01B *7/30*; G08C *19/10*
U.S. Cl. 324—660 **29 Claims**

1. A capacitive position-sensing system of the type comprising

a plurality of conducting elements lying essentially in a configuration defining a smooth surface;

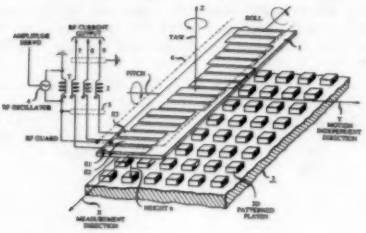
at least some of said elements being spaced apart in said smooth surface in a first direction in which motion is to be sensed;

means for providing capacitive effects with respect to said elements, including

means for forming a capacitive reference surface for said elements; and

means for sensing differences of capacitances between the reference surface and respective ones of said elements;

the means for providing capacitive effects with respect to said elements including



means for establishing a spatially modulated repetitive capacitive pattern between said reference surface and said conducting elements;

said system being characterized in that

the forming means forms a conductively monolithic capacitive reference surface;

the spaced apart elements are subdivided into at least three groups; and

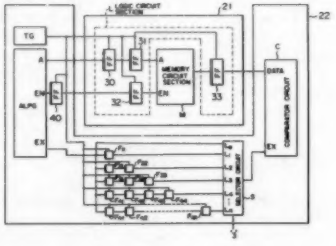
the sensing means simultaneously senses at least two capacitive difference signals.

4,893,072

APPARATUS FOR TESTING AN INTEGRATED CIRCUIT DEVICE

Takashi Matsumoto, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 210,094
Claims priority, application Japan, Jun. 29, 1987, 62-162158
Int. Cl.[4] G01R *31/00*
U.S. Cl. 371—223 **13 Claims**



1. An apparatus for testing an integrated circuit device comprising:

means for generating a test signal to be supplied to said integrated circuit device under control of a clock signal so that said integrated circuit device produces an output signal in response to said test signal;

means for generating an expected signal to be hopefully delivered from said integrated circuit device in response to said test signal;

means connected with said expected signal generating means

for transferring said expected signal under control of said clock signal with a time delay shift associated with the period of said clock signal; and

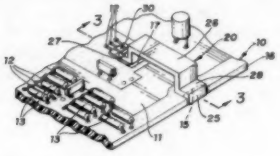
means for comparing said output signal of said integrated circuit device with said expected signal delivered through said expected signal transferring means to check performance characteristics of said integrated circuit device.

4,893,073

ELECTRIC CIRCUIT BOARD CURRENT SENSOR

Brian P. McDonald, Saginaw, and Steven J. Collier-Hallman, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 30, 1989, Ser. No. 303,702
Int. Cl.[4] G01R *33/00*; H05K *13/04*; F02P *3/00*
U.S. Cl. 324—117 H **3 Claims**



1. An electric circuit board current sensor comprising a circuit board of insulting material with a thin current trace of electrically conducting material on one side of the circuit board near an edge thereof, other electric components on the circuit board effective, when electric power is applied thereto, to produce an electric current through the current trace, a notch in the edge of the circuit board and an opening therethrough on opposite sides of the current trace, a magnetic sensor In the opening and a flux member mounted on the circuit board surrounding the current trace;

the flux member being made of a ductile magnetic material and having a first portion thereof adjacent the circuit board on the side thereof opposite the current trace with a free end comprising a latching portion inserted in the opening, a second portion on the same side of the circuit board as the current trace but spaced therefrom with a free end adjacent the opening, and an end portion engaging the notch and joining the first and second portions on the other side of the current trace from the free ends, the free ends being biased by an internal spring characteristic of the flux member to engage opposite sides of the magnetic sensor and thus complete a magnetic circuit therewith around the current trace, the flux member being positively retained on the circuit board in a predetermined alignment around the current trace by the notch and opening of the circuit board, whereby current through the current trace generates a magnetic flux in the flux member which is sensed by the magnetic sensor.

4,893,074

ELECTRONIC DEVICE TESTING SYSTEM

Alyn R. Holt, Cherry Hill, N.J., and Brian R. Moore, Postcombe, England, assignors to inTEST Corporation, Cherry Hill, N.J.

Filed May 13, 1988, Ser. No. 193,768
Int. Cl.[4] G01R *1/00, 1/04*
U.S. Cl. 324—158 F **19 Claims**

1. An electronic device testing system comprising:

a support structure;

a positioner movable along said support structure;

a test head assembly including:

(a) a cradle,

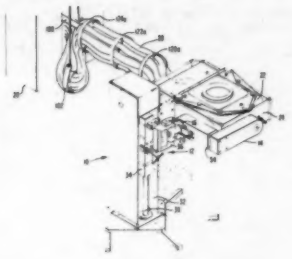
(b) means for attaching said cradle to said positioner for pivotal movement of said cradle about a horizontal axis,

(c) a test head, and

(d) means for attaching said test head to said cradle for pivotal movement of said test head about a second axis pivotable about said horizontal axis in a plane perpendicular to said horizontal axis;

a test cabinet;

a cable support;



means for attaching a first end of said cable support to said test head assembly;

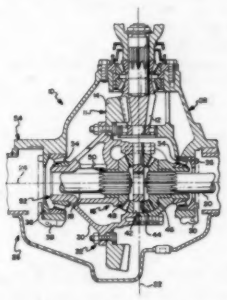
and a cable connected between said test head and said test cabinet and extending along said cable support away from said test head assembly.

4,893,075

DUAL SPEED SENSOR PICKUP ASSEMBLY WITH ANTI-CROSS TALK COILS

Joseph B. Dierker, Jr., Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 237,920, Aug. 29, 1988, abandoned. This application Oct. 21, 1988, Ser. No. 260,963
Int. Cl.[4] G01B *7/14*; G01P *3/48, 3/54*
U.S. Cl. 324—174 **11 Claims**



1. A dual speed sensor pickup assembly for sensing the rotational velocity of a first and a second exciter rotor, said exciter rotors closely axially spaced and independently rotatable about a common axis of rotation, said pickup assembly comprising mounting means for mounting said pickup assembly in predetermined position relative to said first and second exciter rotors, a first and a second closely spaced speed sensor assembly fixedly retained in said mounting means, each of said speed sensor assemblies comprising a ferromagnetic pole piece, a permanent magnet and a conductive coil surrounding the pole piece, said pole pieces each defining a longitudinally extending axis about which the coil is looped; said coils each having a composite signal induced therein composed of a true speed signal of the associated exciter rotor and a cross talk signal from the other speed sensor; said pickup assembly characterized by:

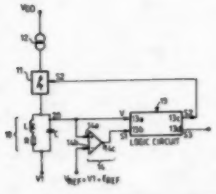
each speed sensor including anti-cross talk means associated therewith for producing an anti-cross talk signal added to the composite signal in the coil of the other speed sensor for canceling the cross talk signal therein.

4,893,076

PROXIMITY DETECTOR USING INDUCTIVE EFFECT ON OSCILLATING CIRCUIT THE CHARGE OF WHICH IS CONTROLLED BY A PULSE OF SHORT DURATION

Didier Leonard, Hiersac; Jean M. Periot, La Couronne, and Pierre Petit, Champniers, all of France, assignors to La Telemecanique Electrique, France

Filed Apr. 22, 1988, Ser. No. 184,853
Claims priority, application France, Apr. 23, 1987, 87 05961
Int. Cl.[4] G01B *7/14*
U.S. Cl. 324—207 **5 Claims**



1. An inductive proximity detector including:

i- an oscillating circuit comprising a coil which is influenced by an object to be detected and a capacitor, said oscillating circuit having a predetermined pseudo-oscillation period and a hot point terminal ;

ii- a power supply source and controllable switch means connecting the power supply source to the hot point terminal of the oscillating circuit, said switch means having a control input ;

iii- logic circuit means having an output connected to said control input and generating square wave signals during predetermined periodic time intervals, said pulses opening the switch means during said intervals, said logic circuit means having a further output on which a measurement signal is produced, and

iv- comparator means comparing the voltage at the hot point terminal of the oscillating circuit with a predetermined voltage threshold, said comparator means having an output ;

v- said logic circuit means having an input connected to the hot point of said oscillating circuit and a further input connected to the output of the compatator means ;

vi- said predetermined time intervals being substantially equal to half the said pseudo-oscillation period.

4,893,077

ABSOLUTE POSITION SENSOR HAVING MULTI-LAYER WINDINGS OF DIFFERENT PITCHES PROVIDING RESPECTIVE INDICATIONS OF PHASE PROPORTIONAL TO DISPLACEMENT

Richard C. Auchterlonie, 5701 N. Sheridan #29-q, Chicago, Ill. 60660

Continuation-in-part of Ser. No. 55,422, May 28, 1987. This application Mar. 31, 1988, Ser. No. 175,760
Int. Cl.[4] G01B *7/14; 1/06;* G08C *19/06, 19/12*
U.S. Cl. 324—208 **19 Claims**

1. An inductive position sensor comprising, in combination,

a first support,

a second support disposed in close proximity to said first support, said second support being relatively movable with respect to said first support along a direction,

a first set of electrically conductive windings mounted on said first support,

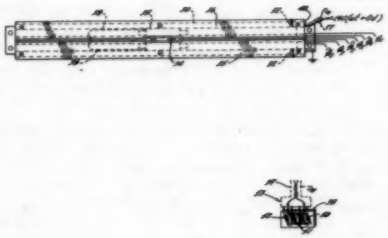
a second set of electrically conductive windings mounted on said first support,

a third set of electrically conductive windings mounted on said second support,

said second support being relatively moveable with respect to said first support along a predefined direction to align said third set of windings with locations within a predefined range of locations over said first support, said first set of windings being disposed in a first periodic spatial pattern extending along said direction over said range, said first periodic spatial pattern having a first pitch, said first periodic spatial pattern having multiple cycles over said range,

said second set of windings being disposed in a second periodic spatial pattern extending along said direction over said range, said second periodic spatial pattern having a second pitch, said second periodic spatial pattern having multiple cycles over said range, said second pitch being substantially different from said first pitch, said first and second sets of windings being disposed in close proximity to each other and being registered one over the other along said direction and over said range,

said first set of windings being inductively coupled to said third set of windings such that said first set of windings is connectable to one of a plural-phase source of alternating current and a phase discriminator, and said third set of windings is connectable to the other of said plural-phase source of alternating current and said phase discriminator, when said second set of windings is disconnected, to provide a first phase indication that is proportional to



displacement of said second support with respect to said first support along said direction and over said range, said first phase indication being a first periodic function of said displacement that varies continuously over at least two pi (2π) radians, values of said displacement differing by approximately said first pitch giving rise to the same values of said first phase indication, and

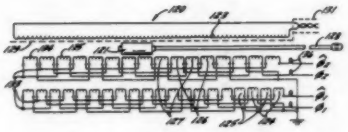
said second set of windings being inductively coupled to said third set of windings such that said second set of windings is connectable to said one of said plural-phase source of alternating current and said phase discriminator, and said third set of windings is connectable to said other of said plural-phase source of alternating current and said phase discriminator, when said first set of windings is disconnected, to provide a second phase indication that is proportional to displacement of said second support with respect to said first support along said direction and over said range, said second phase indication being a second periodic function of said displacement that varies continuously over at least two pi (2π) radians, values of said displacement differing by approximately said second pitch giving rise to the same values of said second phase indication, whereby said displacement is determinable from said first and second phase indications.

4,893,078

ABSOLUTE POSITION SENSING USING SETS OF WINDINGS OF DIFFERENT PITCHES PROVIDING RESPECTIVE INDICATIONS OF PHASE PROPORTIONAL TO DISPLACEMENT

Richard C. Auchterlonie, 5701 N. Sheridan #29-q, Chicago, Ill. 60660

Filed May 28, 1987, Ser. No. 55,422
Int. Cl.[4] G01B 7/14; G08C 19/06; H01F 21/02; H02K 24/00
U.S. Cl. 324—208 17 Claims



1. A method of sensing the position of a selected location over a certain range of locations along a predefined path, said method comprising the steps of:

(a) establishing an electromagnetic field along said path, said electromagnetic field alternating at a predetermined frequency but having a first phase that is a predetermined first periodic function of position within said range, said first periodic function having a predetermined first wavelength, said range extending over a distance of at least twice said first wavelength, such that said first phase varies continuously over two pi (2π) radians over a distance of said first wavelength in said range and said first phase is proportional to position in said range but said first phase has the same value at two different positions in said range which are spaced apart by a distance of said first wavelength,

(b) sensing the phase of said electromagnetic field at said selected location to obtain a first phase indication, said first phase indication thereby being related to said position of said location according to said first periodic function,

(c) changing said electromagnetic field along said path so that said electromagnetic field has a second phase that is a predetermined second periodic function of position within said range, said second periodic function having a predetermined second wavelength, said range extending over a distance of at least twice said second wavelength, such that said second phase varies continuously over two pi (2π) radians over a distance of said second wavelength in said range and said second phase is proportional to position in said range but said second phase has the same value at two different positions in said range which are spaced apart by a distance of said second wavelength, said first wavelength being different from said second wavelength so that every position within said range determines a unique combination of said first phase and said second phase but neither said first phase alone nor said second phase alone is sufficient to uniquely determine said position,

(d) sensing the phase of the changed electromagnetic field at said selected location to obtain a second phase indication, said second phase indication thereby being related to the position of said location according to said second periodic function, and

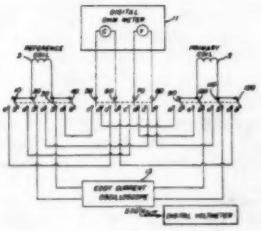
(e) computing said position of said location from said first and second phase indications.

4,893,079

METHOD AND APPARATUS FOR CORRECTING EDDY CURRENT SIGNAL VOLTAGE FOR TEMPERATURE EFFECTS

Thomas A. Kustra, N. Huntingdon, and Alfred J. Caffarel, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1988, Ser. No. 237,203
Int. Cl.[4] G01N 27/72; G01B 7/10; G01R 33/12
U.S. Cl. 324—225 3 Claims



2. An apparatus for measuring physical characteristics of an electrically conductive material in a heated environment comprising:

eddy current probe means including a primary coil and a reference coil for producing an eddy current signal in response to said probe means coming in contact with said material;

resistance measuring means including a digital ohm meter for measuring the resistances of said primary coil and said reference coil;

output means for outputting said eddy current signal; and

switch means connected between said probe means, said resistance measuring means, and said output means, for connecting said probe means to said resistance measuring means to measure the resistances of said coils, and for connecting said probe means to said output means to obtain said eddy current signal, said switch means connecting said probe means directly to said resistance measuring means and said output means so that said eddy current signal and said measured resistances are performed at substantially the same time and under the same conditions in the heated environment, wherein the resistance differential of the coils is proportional to temperature differential changes which cause errors in said eddy current signal produced by said probe means, such that said error may be compensated for by correcting the measured value of said eddy current signal in accordance with the measured resistances of the coils.

4,893,080

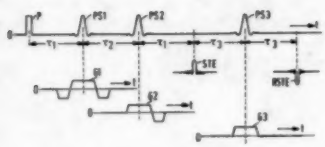
VOLUME-SELECTIVE SPECTROSCOPY USING REFOCUSED ECHOES

Peter R. Luyten; Jan A. Den Hollander; Johannes H. Den Boef, and Johannes J. Van Vaals, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 10, 1988, Ser. No. 230,630
Claims priority, application Netherlands, Aug. 12, 1987, 8701889
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—309 8 Claims

1. A method of determining a nuclear magnetization distribution in at least a part of an object, such part of the object being excited by a sequence of rf pulses generating a refocussed

stimulated echo from such part which is sampled; characterized in that the sequence comprises at least four rf pulses, a first



pulse of which is a frequency-selective 90° excitation pulse, and another pulse of which is a refocussing 180° pulse.

4,893,081

DRIVEN EQUILIBRIUM IN MAGNETIC RESONANCE IMAGING

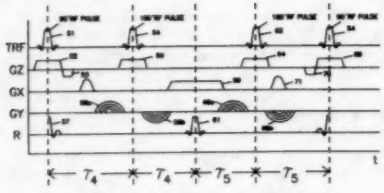
Yuval Zur, Hertzlia, Israel, assignor to Elscint Ltd., Haifa, Israel

Continuation of Ser. No. 78,889, Jul. 29, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 330,971

Claims priority, application Israel, Aug. 15, 1986, 79732

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **19 Claims**



1. A method of applying a modified spin echo sequence having selecting (Gz), viewing (Gx) and phase encoding (Gy) gradient pulses for acquiring magnetic resonance imaging data wherein echo signals are driven to equilibrium, said method comprising the steps of:

applying a first 90° RF pulse for tipping spins normally aligned along the Z axis into a transverse plane where the spins dephase,

applying a first 180° Rf pulse at a time τ after the application of the first 90° RF pulse to rephase the dephased spins and form a first echo signal at a time 2τ after the application of the first 90° RF pulse,

applying another 180° RF pulse at a time $n\tau$ after receipt of the first echo signal to again rephase dephasing spins and form another echo signal, where n is any positive odd integer starting with 1,

applying a second 90° RF pulse during formation of said another echo signal at a time τ after the application of said another 180° Rf pulse to drive said another echo signal to equilibrium,

applying said gradient pulses to maximize said another echo signal driven to equilibrium, said step of applying said gradient pulses including the steps of:

applying a Gz gradient pulse during the application of each of the RF pulses,

applying a Gx gradient pulse during the receipt of said first echo signal,

applying a prior Gx gradient pulse prior to the receipt of said first echo signal,

applying a subsequent Gx gradient pulse after the receipt of said first echo signal and before the receipt of said another echo signal, and

applying Gy gradient pulses of different amplitudes symmetrically distributed in time about both the first and said another 180° RF pulse, said distributed Gy gradient pulses being positive on one side of each of the 180° RF pulse and negative on the other side of each of said 180° RF pulses.

4,893,082

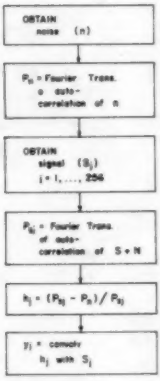
NOISE SUPPRESSION IN MAGNETIC RESONANCE IMAGING

John H. Letcher, III, 7421 S. Marion, Tulsa, Okla. 74136

Filed Feb. 13, 1989, Ser. No. 309,804

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—312 **12 Claims**



1. A method of removing the effects of noise from a received signal (s=n+g) containing the noise (n) and an actual signal (g), comprising:

(a) obtaining at least one sample of ambient noise (n);

(b) obtaining a power spectrum of the noise (P_n);

(c) obtaining a data set of the signal (s);

(d) obtaining a power spectrum of the signal (P_s);

(e) obtaining a transfer function $h=(P_s-P_n)/P_s$; and

(f) obtaining the convolution of h with s yielding signal (y), wherein y≅g.

4,893,083

MAGNETIC RESONANCE APPARATUS COMPRISING INTEGRATED GRADIENT R.F. COILS

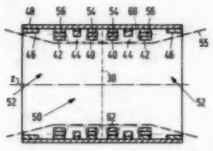
Johannes A. Overweg, and Wilhelmus R. M. Mens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1988, Ser. No. 233,308

Claims priority, application Netherlands, Aug. 19, 1987, 8701949

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **21 Claims**



1. A magnetic resonance apparatus, comprising a magnet system for generating a steady magnetic field, a magnet system for generating mutually perpendicular field gradients, and an

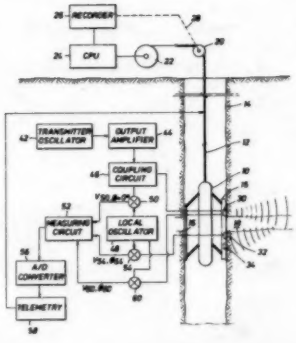
r.f. coil for generating a spatially uniform r.f. magnetic field, characterized in that the gradient coil system and the r.f. coil are combined so as to form a magnetically and structurally integrated gradient/r.f. coil system and in that current conductors of the gradient coil system and current conductors of the r.f. coil are situated in substantially the same cylinder generated surface.

4,893,084

FORMATION ELECTROMAGNETIC PARAMETERS MEASURING TOOL USING TRANSMITTER REFERENCE AND REFLECTED SIGNALS AND A RECEIVED SIGNAL

Rama N. Rau, League City, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed May 19, 1988, Ser. No. 196,164
Int. Cl.[4] G01V *3/30, 3/38*
U.S. Cl. 324—341 **17 Claims**



1. For use in a well borehole for dielectric measurements of earth's formations adjacent to the borehole, an apparatus which comprises:

(a) a sonde adapted to be lowered in a well borehole for engagement with the sidewall of the borehole;

(b) a transmitting antenna supported by said sonde in contact with the borehole wall for transmitting microwave electromagnetic signals of a specified wave length into the adjacent formation;

(c) a receiving antenna mounted at a distance from said transmitting antenna and supported by said sonde in contact with the borehole wall for receiving the transmitted microwave signals;

(d) measuring means connected to said transmitting antenna and receiving antenna for making measurements of microwave electromagnetic signals transmitted through formation between said antennas and wherein the measurements include a transmitter reference signal, a transmitter reflected signal and a received signal; and

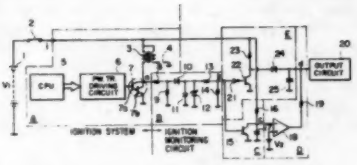
(e) means for determining formations resistivity and dielectric constant from measurements from said measuring means.

4,893,085

IGNITION MONITORING CIRCUIT FOR AN IGNITION SYSTEM OF AN INTERNAL COMBUSTION ENGINE INCLUDING AN ERRONEOUS PULSE ELIMINATING CIRCUIT MEANS

Masaaki Taruya, and Kiyoshi Ookawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,484
Claims priority, application Japan, Mar. 18, 1988, 63-63423
Int. Cl.[4] F02P *17/00*; G01P *3/42*
U.S. Cl. 324—378 **6 Claims**



1. An ignition monitoring circuit for an ignition system of an internal combustion engine, comprising:

first pulse shaper circuit means, coupled to a terminal of a primary winding of an ignition coil of the ignition system, for shaping voltage impulses, occurring at the terminal of the primary winding of the ignition coil upon production of ignition voltages, into pulses of a predetermined height;

second pulse shaper circuit means, coupled to an output of said first pulse shaper circuit means, for converting said pulses outputted from said first pulse shaper means into pulses of a fixed predetermined width; and

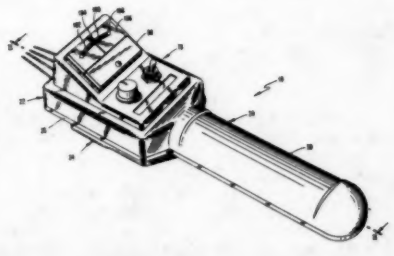
erroneous pulse eliminating circuit means, having an input coupled to the output of the first pulse shaper circuit means and supplied with a voltage from a battery, for eliminating an output pulse of said second pulse shaper means not corresponding to any output pulse of said first pulse shaper means, said erroneous pulse eliminating circuit means sustaining output pulses of said second pulse shaper circuit means corresponding to output pulses of said first pulse shaper means, by supplying the voltage from the battery to an output terminal of said second pulse shaper means in response to output pulses of said first pulse shaper circuit means.

4,893,086

BAR-TO-BAR ARMATURE TESTER

Junior R. Shrewsbury, 2628 Bland Rd., Bluefield, W. Va. 24701

Filed Jan. 24, 1989, Ser. No. 301,045
Int. Cl.[4] G01R *31/34*
U.S. Cl. 324—545 **11 Claims**



1. A tester for testing electric motor armature windings to

determine whether each of said windings is shorted, open, reversed, or properly installed and unbroken, comprising:

a hollow housing having a front end and a rear end;

first, second, third and fourth electrically conductive elongated probes connected to and extending forwardly from said front end of said housing and positioned respectively successively in side-by-side spaced relation;

source means, disposed within said hollow housing and electrically connected across said first and third probes, for providing a voltage across a selected coil winding of said armature;

indicator means disposed within said hollow housing and electrically connected across said second and fourth probes, for detecting and indicating whether said selected coil winding is shorted, whether said selected coil winding is open, whether said selected coil winding is reversed, or whether said selected coil winding is proper; and

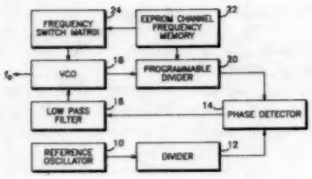
probe marking means on said second probe for marking which of said probes is contacting an armature bar which is directly connected to said selected coil winding.

4,893,087

LOW VOLTAGE AND LOW POWER FREQUENCY SYNTHESIZER

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,380
Int. Cl.[4] H03B *19/00*; H03L *7/00*
U.S. Cl. 328—14 **4 Claims**



1. A low voltage and low power frequency synthesizer including a variable divider phase locked loop for controlling the output frequency of a voltage controlled oscillator (VCO) comprising:

memory means having information corresponding to a desired frequency and divisor information for the phase locked loop and the VCO; and

frequency capacitance switch means coupled between said memory and said VCO responsive to additional information to select a predetermined value of capacitance, said switch means including a plurality of capacitors from which the frequency capacitance switch means may select, said switch means further including means producing a course tuning frequency determining network of the VCO whereby a broad range of frequencies can be synthesized at lower voltages and maintained with lower power consumption with the phase locked loop operating to maintain the precision of the desired frequency.

4,893,088

TRANSIMPEDANCE FOCAL PLANE PROCESSOR

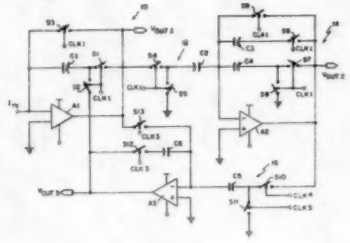
Brent A. Myers, Palm Bay, and William W. Wiles, Jr., West Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 16, 1988, Ser. No. 271,656
Int. Cl.[4] G11C *27/02*; H03F *1/08*
U.S. Cl. 328—127 **19 Claims**

1. A transimpedance processor for converting photocurrents into voltage comprising:

input integrator means for integrating input signals over a measurement cycle on a first capacitor of said input integration means;

S/H mans connected to an output of said input integrator means for sampling and holding the output of said integrating means; and



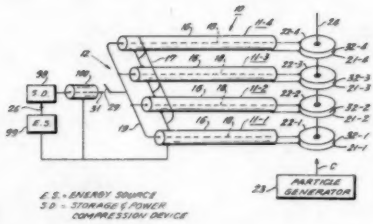
precharge means connected between an output of said S/H means and said first capacitor and including a precharge integrator means for integrating output of said S/H means and generating a voltage as a function of input background level and switching means for precharging said first capacitor with negative of the output of said precharge integrator means in a precharge cycle.

4,893,089

PULSE POWER LINAC

Francesco Villa, Alameda, Calif., assignor to Harris Blake Corporation, Great Neck, N.Y.

Filed Sep. 14, 1988, Ser. No. 244,121
Int. Cl.[4] H05H *5/00*
U.S. Cl. 328—233 **17 Claims**



1. A linear accelerator including:

first means for emitting charged particles that travel along a linear path extending through a particle accelerating region;

second means defining a first plurality of accelerating gaps disposed in series at said accelerating region;

each of said accelerating gaps being defined by a pair of spaced electrodes disposed transverse to said path, and each of said electrodes having an aperture through which said path extends;

third means for generating energy pulses to power said accelerator;

transmission line means connecting said electrodes to a power injection region where said pulses are applied to said transmission line means to propagate therealong to said accelerating gaps;

said transmission line means including a plurality of line sections that are connected in parallel at said power injection region, and an individual one of said line sections being connected to each pair of said spaced electrodes;

said line sections being constructed to delay arrival of each of said pulses at said accelerating gaps in a predetermined

sequence so that at each of said gaps as charged particles pass thereacross they are subjected to an accelerating force generated by an electric field which is derived from one of said pulses;

each of said line sections comprising elongated plate-like first and second conductors with a space therebetween.

4,893,090

AMPLIFIER ARRANGEMENT

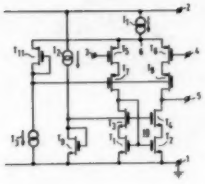
Arnoldus J. J. Bondewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1988, Ser. No. 241,689

Claims priority, application Netherlands, Sep. 14, 1987, 8702177

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **13 Claims**



1. An amplifier arrangement comprising a differential amplifier having two input terminals for receiving an input voltage and a differential-to-single-ended converter having an output terminal for supplying an output current, said converter including a first and a second transistor of a first conductivity type whose source electrodes are coupled to a first supply terminal and whose gate electrodes are coupled together, and a third and a fourth transistor of the first conductivity type arranged in cascade with the first and the second transistors, respectively, and having their gate electrodes coupled together, the gate electrode of the first transistor being coupled to a drain electrode of the third transistor, said differential amplifier including a fifth and a sixth transistor of a second conductivity type opposite to the first conductivity type whose gate electrodes are coupled to the input terminals and whose source electrodes are coupled to a common terminal which is coupled by means of a first constant current source to a second supply terminal, and a seventh and an eighth transistor of the second conductivity type which are arranged in cascade with the fifth and the sixth transistors respectively, the arrangement also including a bias circuit for biasing the gate electrodes of the third and the fourth transistors at a voltage which is substantially equal to the sum of one threshold voltage and two saturation voltages, said bias circuit including a ninth transistor of the first conductivity type whose source electrode is coupled to the first supply terminal and whose gate electrode is coupled to the gate electrodes of the third of the fourth transistors and to its drain electrode, characterized in that the drain electrode of the ninth transistor is coupled to the second supply terminal by means of a second constant current source.

4,893,091

COMPLEMENTARY CURRENT MIRROR FOR CORRECTING INPUT OFFSET VOLTAGE OF DIAMOND FOLLOWER, ESPECIALLY AS INPUT STAGE FOR WIDE-BAND AMPLIFIER

William J. Lillis, and Anthony D. Wang, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

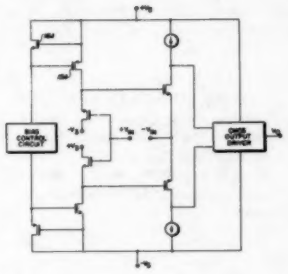
Filed Oct. 11, 1988, Ser. No. 255,774

Int. Cl.[4] H03F *3/45, 3/30*

U.S. Cl. 330—253 **17 Claims**

10. A method of producing a current which represents an inequality between a parameter of a first MOSFET of a first channel type and a second MOSFET of a second channel type, comprising the steps of:

(a) forcing a control current through a source electrode of the first MOSFET to generate a first gate-to-source voltage;



(b) applying the first gate-to-source voltage between gate electrode and a source electrode of the second MOSFET to cause a controlled current to flow in the second MOSFET, the controlled current including a first component which is proportional to the control current and a second component which is related to the inequality.

4,893,092

OPERATIONAL AMPLIFIER CIRCUIT

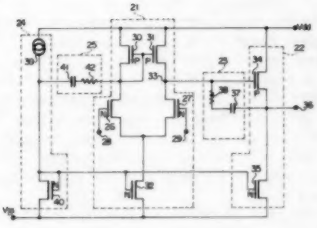
Toshiyuki Okamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 30, 1988, Ser. No. 252,396

Claims priority, application Japan, Oct. 2, 1987, 62-250520

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **10 Claims**



1. An operational amplifier circuit having two input nodes and an output node, said amplifier circuit comprising:

(a) a differential amplifier input stage coupled between first and second voltage sources and responsive to a difference voltage applied between said two input nodes for producing an amplified signal with respect to said difference voltage;

(b) an output stage coupled between said first and second voltage sources and responsive to said amplified signal for producing an output signal at said output mode with respect to said difference voltage;

(c) a phase compensating circuit coupled between said differential amplifier input stage and said output stage and operative to absorb a distortion appearing in said amplified signal to allow said output signal to similarly vary with respect to said difference voltage;

(d) a biasing circuit coupled between said first and second voltage sources and operative to produce a biasing voltage signal which allows constant currents corresponding

to the biasing voltage signal to flow through said differential amplifier input stage and said output stage, respectively; and

(e) a phase compensation supporting circuit coupled at one end thereof to said differential amplifier input stage and at the other end thereof to said biasing circuit and operative to support said phase compensating circuit for absorption of a distortion in said amplified signal under a high frequency operation.

4,893,093

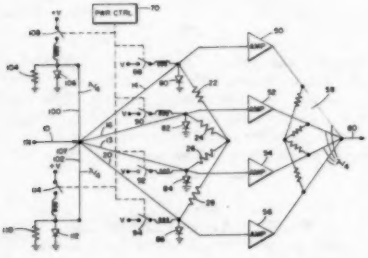
SWITCHED POWER SPLITTER

Edward A. Cronauer, Massapequa Park, and Eileen T. Sarc, Bohemia, both of N.Y., assignors to United Technologies Incorporated, Hartford, Conn.

Filed Feb. 2, 1989, Ser. No. 305,960

Int. Cl.[4] H03F *3/68*

U.S. Cl. 330—295 **8 Claims**



1. A switched power splitter comprising:

input means for providing high frequency input signals;

a plurality of amplifier means;

first transmission line means connected between said input means and each said amplifier means, each said first transmission line means exhibiting an impedance which may be altered to either a high or low level state;

resistance means coupled between each said first transmission line means, said resistance means being balanced and having no substantial current flow therethrough when all said first transmission line means are in their low level impedance state and being unbalanced and having a current flow therethrough when one or more of said first transmission line means is in its high impedance state and another of said

first transmission line means is in its low impedance state;

second transmission line means connected in shunt across said first transmission line means, the impedance of said second transmission line means being alterable to either a low or high level state;

a control means connected to said first and second transmission line means for selectively altering the impedance state of said first transmission line means and for simultaneously altering the impedance state of said second transmission line means in the opposite manner.

4,893,094

FREQUENCY SYNTHESIZER WITH CONTROL OF START-UP BATTERY SAVING OPERATIONS

Barry W. Herold, Boca Raton, and Omid Tanernia, Coconut Creek, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1989, Ser. No. 322,393

Int. Cl.[4] H03L *7/18*

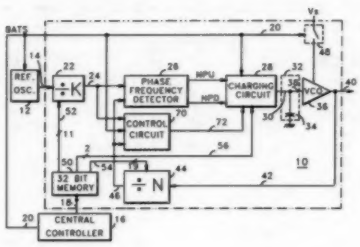
U.S. Cl. 331—1 A **8 Claims**

1. A frequency synthesizer governed by a battery saving signal having sleep and awake cycles, for generating a synthesized frequency signal, said frequency synthesizer comprising:

first means for generating a reference frequency signal;

second means controlled by a governing signal to generate a feedback frequency signal representative of said synthesized frequency signal, said first and second means being governed by said battery saving signal to enable and inhibit the generation of their respective reference and feedback frequency signals during the awake and sleep cycles, respectively, thereof;

storage means for maintaining said governing signal;



means governed by said battery saving signal to adjust the governing signal of said storage means in response to said reference and feedback frequency signals solely during the awake cycles of said battery saving signal; and

control means governed by said battery saving signal, said reference frequency signal and said feedback frequency signal to inhibit the adjustment of said governing signal by said adjusting means until both of said first and second generating means are determined to be effectively enabled in response to an awake cycle of said battery saving signal.

4,893,095

FREQUENCY STABILIZED OSCILLATOR

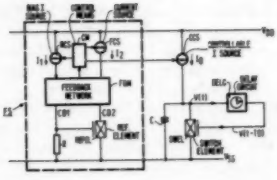
Werner F. Thommen, Staefa, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,338

Claims priority, application Netherlands, Aug. 4, 1987, 8701831

Int. Cl.[4] H03B *1/00*

U.S. Cl. 331—57 **8 Claims**



1. An oscillator comprising, connected between a first and a second power supply terminal, a series connection of a current source which is controllable by frequency stabilization means and which is connected to the second power supply terminal and a parallel connection of a capactive load and a current path of a switching element, which parallel connection is connected to the first power supply terminal, a junction point between the controllable current source and the parallel connection being fed back, via a delay circuit, to a control connection of the switching element, characterized in that the frequency stabilization means comprise:

a first current branch including a bias current source and a

resistor which are connected to the second power supply terminal and the first power supply terminal, respectively,

a second current branch including a further current source and a current path of a reference element which is substantially identical to the switching element, which further current source and current path are connected to the second power supply terminal and the first power supply terminal, respectively, the controllable current source and the further current source supplying substantially equal currents and being coupled to the bias current source so as to be controllable in the same sense, a control connection of the reference element being coupled to the resistor, and

feedback means for feeding back a voltage across the reference element in the second current branch to the first current branch so that the bias current source can be adjusted such that the ratio of a control voltage for the reference element and the current in the second current branch is substantially constant.

4,893,096

OSCILLATOR CIRCUIT COMPRISING AN OSCILLATOR WITH A CMOS

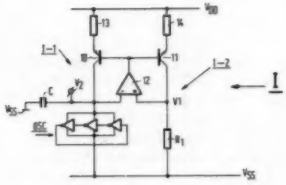
Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1988, Ser. No. 203,048

Claims priority, application Netherlands, Jun. 5, 1987, 8701316

Int. Cl.[4] H03L *1/00*

U.S. Cl. 331—175 **19 Claims**



1. An oscillator circuit, comprising an oscillator with a CMOS gate, characterized in that the oscillator comprises frequency stabilization means coupled to said oscillator so as to keep a ratio of a current consumed by the CMOS gate and a supply voltage present across the CMOS gate substantially constant.

4,893,097

METHOD FOR TEMPERATURE COMPENSATION OF A VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR IN A PHASE CONTROL CIRCUIT

Eduard Zwack, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,708

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732627

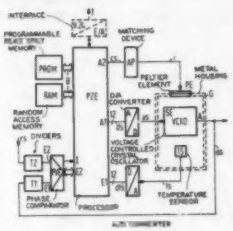
Int. Cl.[4] H03L *1/04*

U.S. Cl. 331—176 **7 Claims**

1. A method for temperature compensation of a voltage-controlled crystal oscillator which includes a crystal in a phase locked loop circuit, comprising the steps of:

controlling the temperature of the crystal oscillator by a heating-cooling device;

sensing the temperature of the crystal oscillator and feeding signals resulting therefrom to a processor;



controlling the heating-cooling device by said processor to a selected temperature of the crystal oscillator lying closest to a current ambient temperature.

4,893,098

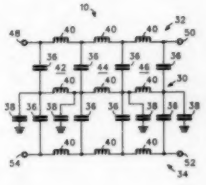
90 DEGREE BROADBAND MMIC HYBRID

Warren L. Seely, and Joseph Staudinger, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1988, Ser. No. 280,094

Int. Cl.[4] H01P *5/18*

U.S. Cl. 333—112 **4 Claims**



1. A four terminal broadband 0/90 degree hybrid comprising:

a plurality of signal path means for transforming the impedance and phasing of an input signal;

a first of said signal path means capacitively coupled to an electric ground to form a central signal path;

said central signal path means for providing an impedance to said ground;

a second and third of said signal path means having ends providing the terminals of the 0/90 degree hybrid coupled to said central signal path through a plurality of capacitance means; and

said plurality of capacitance means for providing an impedance to said central signal path from said second and third signal path means.

4,893,099

EXTENDED RESPONSE DYNAMIC NOISE REDUCTION SYSTEM

James K. Waller, Jr., 1633 Star Batt Dr., Rochester, Mich. 48309

Continuation-in-part of Ser. No. 705,356, Feb. 25, 1985, Pat. No. 4,647,876. This application Nov. 10, 1986, Ser. No. 928,543

Int. Cl.[4] H03H *7/01*

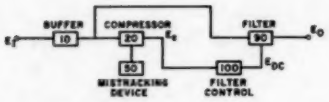
U.S. Cl. 333—17.1 **23 Claims**

1. A noise reduction system for an input signal comprising:

means for compressing said input signal, said compressing means having a first means for sensing said compressed signal and for providing a D.C. signal to said compressing means responsive to said compressed signal to control compression;

means for filtering said input signal over a variably extended range of frequencies; and

second means for sensing said compressed signal and for providing a D.C. signal to said filtering means responsive to levels and quantities of information in a preselected



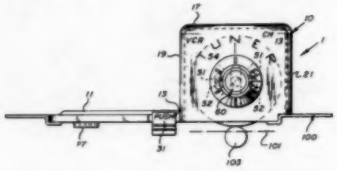
frequency band of said compressed signal to extend the bandwidth of said filtering means when said compressed signal contains more than a predetermined level or quantity of information and to reduce the bandwidth of said filtering means when said compressed signal contains less than a predetermined level or quantity of information.

4,893,100

EXTERNAL MANUAL ROTATABLE DRIVE USEABLE TO TUNE A VCR

Robert L. Spurgeon, 112 W. Douglas, Fairfield, Ill. 62837

Filed Nov. 24, 1987, Ser. No. 124,246
Int. Cl.[4] H03J *1/12*
U.S. Cl. 334—39 **9 Claims**



1. In a first device having a first housing with a first surface, said first surface having a first slot therein with a first rotary wheel protruding partially therethrough and second and third opposed elongated slots adjacent said first surface, an actuator detachably mountable on said first device and including:

(a) a second housing including a bottom surface and an upstanding wall with an opening therethrough;

(b) connection means on said bottom surface for releasably attaching said second housing to said first surface, said connection means comprising opposed tabs releasably engageable in said second and third slots, respectively;

(c) a friction wheel with an actuator shaft protruding through said opening;

(d) said first rotary wheel having a first peripheral surface which is frictionally engaged by a second peripheral surface on said friction wheel when said connector means attaches said second housing to said first surface, whereby rotation of said actuator shaft results in rotation of said friction wheel and first rotary wheel.

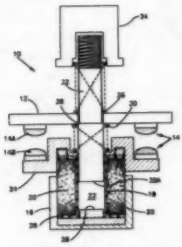
4,893,101

RESETTABLE GROUND FAULT CIRCUIT INTERRUPTER

James M. Robitaille, Cleveland, Ohio, assignor to Ericson Manufacturing Company, Willoughby, Ohio

Continuation of Ser. No. 260,877, Oct. 21, 1988, abandoned. This application Mar. 22, 1989, Ser. No. 327,012
Int. Cl.[4] H01H *83/02, 50/58;* H02H *3/16*
U.S. Cl. 335—18 **10 Claims**

1. A manually resettable ground fault circuit interrupter comprising a pair of normally open contacts, a housing, solenoid means slideably retained by said housing, a contact carrier attached to said solenoid means and having one of said contacts fixed thereon opposite the other contact, said solenoid means being slideable between a first position and a second position, means biasing said solenoid means towards said first position, said contacts being electronically open when said solenoid means is in said first position and said contacts being closed when said solenoid means is in said second position, and a manually actuated plunger which extends at least partially through said solenoid means and is magnetized when said solenoid means conducts a predetermined current, said plunger



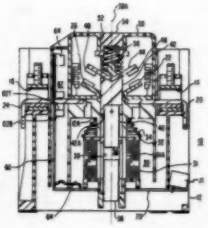
being slideable between a plunger first position and a plunger second position and being biased towards said plunger first position, such that when a predetermined current is conducted by said solenoid means and said plunger is manually actuated said plunger directly engages said solenoid means and upon release of said manual actuation moves said solenoid means to said second position, and when said solenoid means conducts an insufficient current said solenoid means is in said first position regardless of actuation of said plunger.

4,893,102

ELECTROMAGNETIC CONTACTOR WITH ENERGY BALANCED CLOSING SYSTEM

James A. Bauer, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 161,212, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 16,425, Feb. 19, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 230,710
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—132 **11 Claims**



1. An electrical contactor, comprising:

first contact means;

second contact means for being moved into a disposition of electrical continuity with said first contact means;

electromagnet means with armature means which is mechanically interconnected with said second contact means for moving from a first armature means position to a second armature means position to place said second contact means into said disposition of electrical continuity with said first contact means in response to the flow of electrical current through a winding of said electromagnet means;

abutment means against which said armature means abuts to define said second armature means position;

spring means disposed to resist the movement of said armature means, the minimum amount of kinetic energy which when applied to said armature means is sufficient to overcome said spring resistance to cause said first contact means and said second contact means to abut and to cause said armature means to just abut said abutment means without significant rebound at said second armature means position equaling K; and

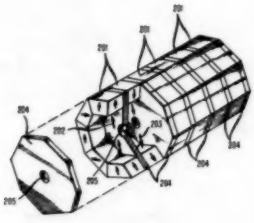
means for supplying electrical current to said winding of said electromagnet means, the total amount of said kinetic energy which is supplied to said armature means during movement thereof being substantially the result of said electrical current flowing in said winding and being substantially equal to K.

4,893,103

SUPERCONDUCTING PYX STRUCTURES

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 24, 1989, Ser. No. 316,710
Int. Cl.[4] H01F 7/22
U.S. Cl. 335—216 **7 Claims**



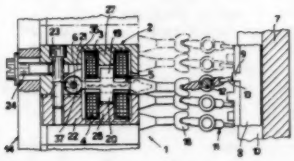
1. A permanent magnetic structure comprising at least one truncated hollow substantially cylindrical flux source for producing a uniform high-field in its central cavity, said high field being perpendicular to the axis of the truncated flux source, and a pair of superconducting plates covering the end faces of the truncated flux source.

4,893,104

ELECTROMAGNETIC ACTUATOR DEVICE, IN PARTICULAR FOR THE SELECTION OF THE NEEDLES ON A KNITTING MACHINE

Leone Donini, Brescia, Italy, assignor to Santoni S.r.l., Brescia, Italy

Filed Dec. 29, 1988, Ser. No. 290,406
Claims priority, application Italy, Jan. 11, 1988, 20415/88[U]
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—266 **12 Claims**



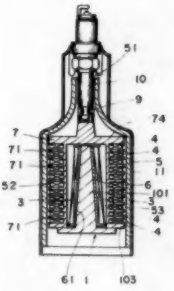
1. Electromagnetic actuator device, in particular for the selection of the needles in knitting machines, comprising at least two windings in a support structure made from a ferromagnetic material, an armature made from a ferromagnetic material hinged relative to said support structure, said armature being subject to the action of the magnetic field generated by said two windings in order to be moved between two angular positions, said armature having a first end for engaging a member to be actuated thereby, charaterized in that said two windings are positioned on opposite sides of the armature, said armature being hinged at a second of its ends opposite said first end, said armature having a hinge axis sustantially perpendicular to the axis of said windings, and said armature having transverse portions projecting from opposite sides thereof to positions between windings.

4,893,105

TRANSFORMER WITH TAPERED CORE

Tsutomu Maeda; Kiyoshi Matsui; Takayuki Kanno, and Kunihiro Sato, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 212,643
Claims priority, application Japan, Jun. 30, 1987, 62-100317[U]; Jun. 30, 1987, 62-100318[U]; Feb. 6, 1988, 63-14809[U]
Int. Cl.[4] H01F 15/04, 27/30
U.S. Cl. 336—84 M **3 Claims**



1. A transformer, comprising:

a low-voltage input coil;

a first bobbin around which said low-voltage input coil is wound, said first bobbin having an inner diameter hole;

a high-voltage output coil;

a second bobbin around which said high-voltage output coil is wound, said second bobbin having an inner-diameter hole;

a core for magnetically connecting both of said coils together;

a connector for connecting to an ignition plug;

an insulating cover coaxially disposed of said second bobbin;

a shield case for entirely surrounding said transformer,

said core comprises a rod portion for insertion into said inner diameter hole of said first bobbin and a flange portion provided at one axial end of said core, said rod portion comprises a tapering cross-section such that said rod portion is gradually tapered from a low voltage side of said high-voltage output coil to a high-voltage side,

said inner diameter hole of said first bobbin is formed to fit with said core,

a coil winding section of said first bobbin is formed so as to define a sufficient insulating distance on said high voltage side,

said connector is mounted on an end surface of said second bobbin on an opposite side of said flange portion of said core so that a mounting direction of said connector substantially coincides with an axial direction of said bobbin,

said core is located in said inner diameter of said first bobbin, and

said first bobbin is located in said inner diameter of said second bobbin.

4,893,106

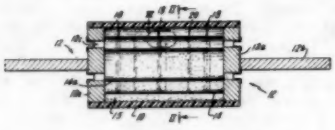
ELECTRICAL FUSES

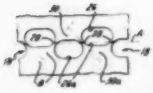
Michel Goldstein, Randolph Township, N.J.; Kenneth D. Howton, Palatine, and Larry L. Jones, Bartlett, both of Ill., assignors to Brush Fuses Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 169,313, Mar. 17, 1988. This application Dec. 21, 1988, Ser. No. 287,111

Int. Cl.[4] H01H *85/04, 85/38*

U.S. Cl. 337—159 **23 Claims**





1. A electrical fuse having an enclosure comprising an insulating tube and electrical terminals closing the ends of the tube, a fuse link in said enclosure interconnecting said terminals, and inert granular arc-quenching material which, alone, is tightly packed in said enclosure leaving voids throughout, and a binder unifying said granular material, said voids containing boric acid.

4,893,107

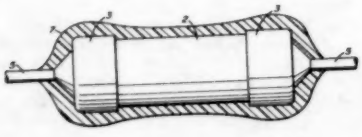
AXIAL MINIATURE FUSE WITH PLASTIC MOLDED BODY

John M. Moner, Ballwin, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 31,489, Mar. 27, 1987, abandoned. This application Dec. 30, 1987, Ser. No. 139,359

Int. Cl.[4] H01H *85/02*

U.S. Cl. 337—186 **13 Claims**



1. A fuse comprising:

an oppositely open ended insulating housing in the form of a cylindrical sleeve;

a fusible element disposed within said housing;

a pair of end cap means closing the ends of said sleeve, securing the ends of said fusible element and making electrical contact thereto, each of said cap means being cup-shaped to provide a cylindrical recess to accommodate an end of said sleeve and having an external lead connected thereto and extending outwardly therefrom for making external electrical connection to said fusible element; each of said cap means containing a quantity of solder fused to make electrical contact between said end cap means and said ends of said fusible element, said fusible element extending diagonally across the length of said sleeve housing and having a portion of each of its ends exiting the open ends of said sleeve and folded back over a portion of the external surface of said sleeve to be located between the sleeve ends and the end cap means; and

an insulating high temperature, resilient coating layer disposed over said sleeve, end cap means and leads to cover, seal, and physically interconnect the exposed exterior surfaces of said sleeve, said pair of end cap means, and a portion of each of said leads adjacent to said pair of end cap means.

4,893,108

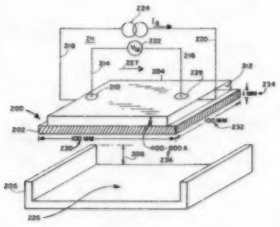
HALOGEN DETECTION WITH SOLID STATE SENSOR

Edward S. Kolesar, Jr., Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 24, 1988, Ser. No. 211,006

Int. Cl.[4] H01L *7/00*

U.S. Cl. 338—34 **18 Claims**



1. Apparatus for detecting the presence of gaseous first halogen components in an unknown mixture of gases comprising the combination of:

a detection substrate member comprised of a second halogen chemical compound of a first metal;

a thin film electrical resistance detector element received on said substrate member and comprised of a second metal in thin film metallic form;

means for moving a stream of said unknown gas mixture over said detection substrate and detector elements; and

means responsive to the combined detector element unknown gas exposure and the substrate member unknown gas exposure resistance changes in said detector element for indicating the presence of said first halogen components in said unknown mixture of gases.

4,893,109

AIRBAG ELECTRICAL IGNITER READINESS DETECTOR

Robert J. Vrabel, Sterling Heights; Dennis W. Rhee, Bloomfield Hills, and Michael R. Seeger, Saline, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,480

Int. Cl.[4] B60Q *1/00*; B60R *21/32*

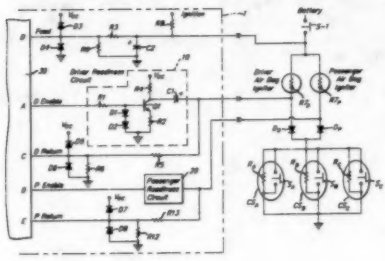
U.S. Cl. 340—438 **10 Claims**

1. In an automotive air bag deployment system containing an explosive igniter that is responsive to inflate an air bag when energized with an electrical current of a predetermined minimum value for a predetermined minimum time period, an apparatus for periodically checking the resistance of the igniter without causing said igniter to responsively inflate said air bag, comprising:

means for applying a predetermined low energy electrical pulse to said igniter, the duration and value of said pulse being selected to be less than said predetermined mini-

mums and therefor insufficient to cause the igniter to reactively explode;

means for detecting the voltage drop across said igniter



when said pulse is applied, comparing said detected voltage drop with values within a predetermined acceptable range, and providing a warning when said voltage drop is outside said acceptable range.

4,893,110

PROCESS FOR DETECTING ANOMALIES BY USE OF PRESSURE AND TEMPERATURE MEASUREMENTS IN A TIRE-MONITORING DEVICE

Jacques Hebert, Jouy-en-Josas, France, assignor to Compagnie Generale des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand, France

Filed Oct. 17, 1988, Ser. No. 258,519

Claims priority, application France, Nov. 9, 1987, 87 15611

Int. Cl.[4] B60C *23/00*

U.S. Cl. 340—442 **10 Claims**

1. A process for monitoring parameters relative to wheels of a vehicle, comprising the steps of:

substantially simultaneously measuring pressure and temperature values in tires mounted on each of the wheels of the vehicle;

calculating a ratio of the measured pressure to the measured temperature for each of the tires;

comparing said ratio for one of the tires with said ratio for at least another one of the tires; and

outputting an alarm when a result N of said comparison deviates from a predetermined range of values.

4,893,111

HEAVY DUTY SOLID STATE FLASHER FOR TURN SIGNAL AND EMERGENCY WARNING LAMPS

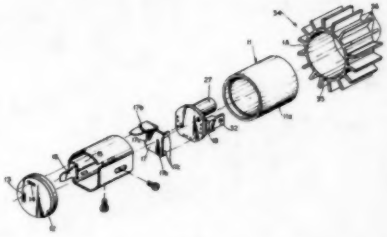
Philip C. Roller, Ashville, N.Y., assignor to Truck-Lite Co., Inc., Falconer, N.Y.

Filed Jan. 25, 1989, Ser. No. 301,446

Int. Cl.[4] B60Q *1/46*

U.S. Cl. 340—471 **17 Claims**

1. A solid state flasher for connection into a circuit path of electrical conduction for plural turn signal and emergency working lamps for a vehicle, capable of flashing very heavy loads with small voltage drop without contact arcing and pitting, comprising a cylindrical cup-shaped housing can having a closed bottom and an opposite open end, a dielectric disc-shaped closure wafer closing and sealing the open end of the can and having a flat inner surface and a pair of prong-receiving slots extending therethrough, an input terminal/heat-sink member in the form of a cylindrical tubular metallic shell axially spanning the space between said wafer and said can bottom disposed in said can in thermally conductive engagement with confronting wall portions of said can and having a contact prong formation integrally extending from one end thereof through one of said slots of said wafer, an output terminal member in the form of a thin metal sheet having a generally rectangular main body positioned inwardly adjacent and parallel to said flat inner surface of said wafer and including a contact prong formation extending 20 integrally perpendicularly from a edge thereof through the other of said wafer slots, and a circuit board assembly having a solid state flasher circuit thereon comprising a planiform circuit board supported inwardly parallel to the main body of said output terminal member to be rigidly carried by the input terminal member which in turn is rigidly carried in selected spaced relation to and surrounded by the input terminal member within said can.



4,893,112

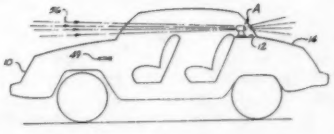
BRAKE LIGHT AND RADAR DETECTION DEVICE

Howard R. Hatcher, 204 Barry Dr., Greer, S.C. 29651

Filed Nov. 23, 1987, Ser. No. 123,772

Int. Cl.[4] B60Q *1/44*

U.S. Cl. 340—479 **14 Claims**



1. In a motor vehicle, a combination vehicle brake light and radar detection device for providing increased detection of radar waves emitted from a traffic speed radar unit and mounting to said motor vehicle in a generally theft-proof manner, said device comprising:

a housing for mounting to said vehicle having a brake light compartment facing a rear of said vehicle with a translucent brake light window:

means for mounting said housing to a surface of a vehicle;

a radar detector for detecting said radar waves; and

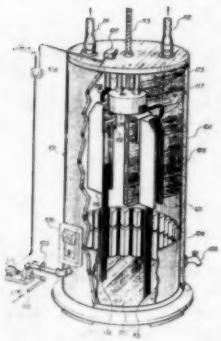
radar receiver means carried within said housing forward of said brake light compartment facing a front of said vehicle for receiving said radar waves coming from a direction forward of said vehicle, and delivering said radar waves to said radar detector.

4,893,113

GAS ALARM AND DETOXIFICATION HEATING SYSTEMS

Sea C. Park, and In P. Park, both of 3836 Birchwood, Skokie, Ill. 60076

Filed Jan. 29, 1988, Ser. No. 150,389
Int. Cl.[4] G08B 17/10
U.S. Cl. 340—632 9 Claims



1. A gas monitoring and heating assembly which comprises an electrochemical reactor containing an anode and a cathode disposed therein for the electrolytic conversion of water into hydrogen and oxygen,

means for recovering the oxygen from the electrochemical reactor and introducing it into the atmosphere,

an oxygen room sensor operatively connected to the electrochemical reactor for controlling the generation of oxygen based upon the measurement of the oxygen content in the room,

a water heater containing a burner,

means for recovering the hydrogen from the electrochemical reactor and introducing it as fuel to the burner,

cold water inlet means and hot water outlet means for introducing cold water to said water heater and recovering hot water from said water heater, said water being heated by indirect heat exchange with the heat generated from the burner, and

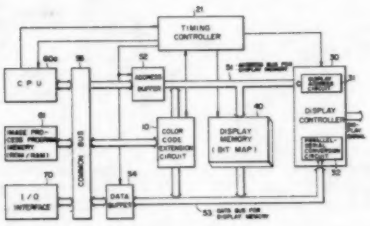
heating means comprising a heating chamber which communicates with the atmosphere, heat exchange conduit means disposed in said heating chamber and connected to said cold water inlet means and hot water outlet means and blower means for blowing air across said heat exchange conduit means, whereby at least a portion of the hot water recovered from the hot water outlet means can be selectively introduced into the heat exchange unit means for heating the air from the blower means, said water with the heat removed therefrom being returned to the cold water inlet means, and a gas alarm operatively associated with the oxygen room sensor, said gas alarm being activated when the oxygen room sensor senses a reduction in the oxygen content of the room below a predetermined level.

4,893,114

IMAGE DATA PROCESSING SYSTEM

Takatoshi Ishii, Tokyo, Japan, assignor to ASCII Corporation, Tokyo, Japan

Continuation of Ser. No. 871,542, Jun. 6, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 212,131
Claims priority, application Japan, Jun. 10, 1985, 60-125794; Sep. 30, 1985, 60-217310
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—703 5 Claims



1. An image data processing system comprising:

color code extension circuit means including: a foreground register for storing foreground color codes, a background register for storing background color codes, a pattern shift register for storing pattern data to be extended to color codes and for shifting the patern data, and a selector for selectively outputting the foreground or background color codes in accordance with the contents of high-order bits of the pattern shift register;

control processor means for setting the foreground color codes, background color codes, pattern data information and corresponding computed addresses into said color code extension circuit means and for outputting an execution signal;

display controller means for outputting a display address corresponding to a display position of the screen and for generating a display signal to be displayed on a screen of a CRT from received corresponding color code data;

display memory means for receiving the display address from said display controller means and for receiving the corresponding output color codes from said color code extension circuit means and for outputting the corresponding color code data to said display controller means; and

timing controller means for receiving the outputted execution signal from said control processor means and for controlling the timing in which said color code extension circuit means outputs the corresponding color codes to said display memory means.

4,893,115

TOUCH SENSITIVE VISUAL DISPLAY SYSTEM

Randall D. Blanchard, Marysville, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation of Ser. No. 767,417, Nov. 12, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 129,873
Int. Cl.[4] G06F 3/033
U.S. Cl. 340—712 39 Claims

1. A touch sensitive visual display system comprising:

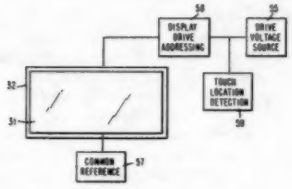
control means for providing a display command signal;

display means connected to said control means and responsive to said display command signal to provide a visual display indication thereof;

touch sensitive means conductively connected to said display means through a low resistance DC path, said touch sensitive means being responsive to a touch thereto to establish selectively an electrical conductive shunt of at least a portion of said display command signal from said

display means through said DC path thereby changing a value of an electrical parameter of said display command signal; and

signal means connected with said control means for measuring said electrical parameter of said display command signal for sensing said change in said electrical parameter value caused by said signal shunt from said display means and indicating a simultaneous provision of said display command signal and said touch.



4,893,116

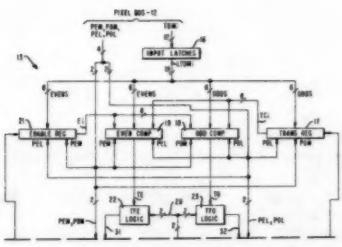
LOGICAL DRAWING AND TRANSPARENCY CIRCUITS FOR BIT MAPPED VIDEO DISPLAY CONTROLLERS

David L. Henderson, Marlboro, Mass.; Brian K. Herbert, Colorado Springs; Michael D. Lahey, Colorado Springs, and Jamey L. Robbins, Colorado Springs, all of Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 16, 1987, Ser. No. 120,902

Int. Cl.[4] G09G *1/14*

U.S. Cl. 340—747 **8 Claims**



1. Apparatus for implementing a read-modify-write sequence in a pixel based video graphics controller using a frame buffer, comprising:

a source of binary data representing transparency color for a pixel;

a source of binary data representing foreground color for the pixel;

binary data representing background color for the pixel sourced from the frame buffer;

means for comparing by pixel foreground color data with transparency color data and generating a signal upon correspondence; and

means for transmitting either the foreground color binary data or the background color binary data to the frame buffer in response to said logically defined signal from the means for comparing.

4,893,117

LIQUID CRYSTAL DRIVING SYSTEMS

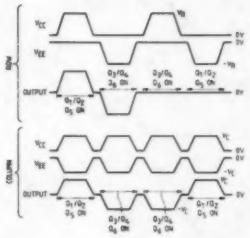
Peter F. Blomley, Bishop's Stortford; Peter J. Ayliffe, Stansted; Ewen R. M. Huffman, and Gregory W. M. Yuen, both of Bishop's Stortford, all of Great Britain, assignors to STC PLC, London, England

Filed Jul. 17, 1987, Ser. No. 74,945

Claims priority, application United Kingdom, Jul. 18, 1986, 8617593; Nov. 27, 1986, 8628366

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—784 **4 Claims**



1. A display device, including a matrix addressed smectic liquid crystal display, row drive and column drive circuits for operation of the display, control means for said row and column drive circuits, and a power supply, wherein said power supply is adapted to provide, from a single floating voltage source, a first waveform comprising positive going pulses and a second waveform comprising negative going pulses, said waveform being of equal pulse repetition rate, wherein each said drive circuit includes means for sampling said positive going and negative going waveforms for deriving therefrom, in response to signals from the control circuit, a series of single cycle alternating output waveforms and zero voltage signals whereby, in use, the pixels of the display may be driven to a scattered state, a cleared state, or an unchanged state, the display device being such that there is a period of zero voltage between successive half cycles of the output waveforms, wherein the relative timing of said positive going and negative going waveform is such that at no time are both a positive going and a negative going pulse simultaneously present thereby limiting the maximum voltage stress applied to a said drive circuit to one half of the peak voltage of its corresponding alternating output waveform, wherein each said row drive and column drive circuit has outputs one for each corresponding row or column of the display, and wherein each output comprises a pair of thyristors whereby, in use, the waveforms are sampled selectively to provide display drive signals.

4,893,118

DEVICE FOR IDENTIFICATION BY PROXIMITY

Jacques Lewiner, Saint Cloud; Claude Hennion, and Didier Leonard, both of Paris, all of France, assignors to Societe Fontaine, Paris, France

Filed Nov. 25, 1987, Ser. No. 125,660

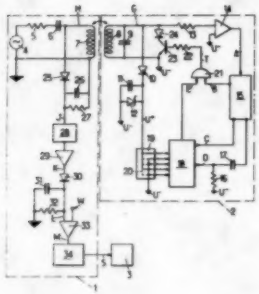
Claims priority, application France, Nov. 25, 1986, 86 16393

Int. Cl.[4] G06K *5/00*; H04Q *7/02*

U.S. Cl. 340—825.54 **4 Claims**

1. A device for enabling the identification of an object or objects at a short distance from the latter, without direct contact with the object, and comprising an interrogator-reader member for generating an alternating voltage at a high frequency F, of a value no greater than on the order of 150 kHz, in an inductance and for receiving and identifying binary response signals appearing in the form of coded sequences of electrical pulses modulating the frequency F and following one another at a formation frequency f less than F, which sequences are applied inductively to said inductance; and an elec-

tronic identification circuit mounted on each object to be identified, said circuit comprising a resonant circuit adapted to be inductively coupled to the said inductance, means for using the voltage collected at terminals of said resonant circuit to provide an electrical supply for the identification circuit, means for forming coded binary signals characteristic of the identification circuit, and an electronic switch, actuated by said binary signals, for short-circuiting the resonant circuit so as to form the said response signals, said identification circuit further



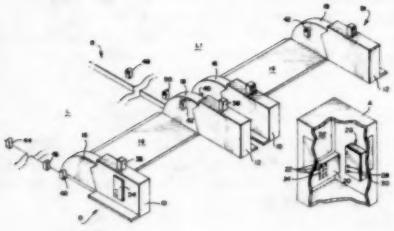
comprising means for modulating, using the coded binary signals, an alternating voltage of intermediate frequency f_i which lies between the frequencies f and F, said intermediate frequency f_i being of the order of 5 to 20 times greater than the frequency f and of the order of 5 to 20 times smaller than the frequency F, and for applying the modulated voltage to the electronic switch to control switching thereof, said interrogator-reader member further comprising means for demodulating from said frequency f_i the coded signals received, after demodulation thereof from the frequency F.

4,893,119

METHOD AND APPARATUS FOR OPERATING A VEHICLE BARRICADE

Kenneth F. Nasatka, Clinton, Md., assignor to Nasatka Barrier, Inc., Clinton, Md.

Filed Sep. 8, 1987, Ser. No. 93,556
Int. Cl.[4] E01F *13/00*
U.S. Cl. 340—928 **33 Claims**



1. A method of operating a vehicle barricade, comprising the steps of:

(a) providing hydraulic means comprising electrically operated motor driven pump means and passive accumulator means, said hydraulic means for operable connection with a barrier for causing the barrier to be displaced between a first lowered position and a second raised position;

(b) providing a plurality of indicator lights, each light operably associated with one of the pump means and the accumulator means and causing the lights to be continuously illuminated when the associated pump means and accumulator means are in an operative condition and causing the associated light to be extinguished when one of the pump means and accumulator means is not in the operative condition;

(c) electrically operating an electromechanical valve means for causing the motor means to displace the barrier between the positions;

(d) electrically operating the valve means for causing the accumulator means to displace the barrier between the positions when the motor means is not operating;

(e) displacing the barrier to the second position upon the occurrence of a defined emergency condition;

(f) providing a first source of electric power for operating the valve means when the motor driven pump means is operating and a second source of electric power for operating the valve means when the motor driven pump means is not operating;

(g) operably interconnecting the sources and thereby maintaining uninterrupted power supply for operating the valve means;

(h) providing a battery power supply as the second source; and,

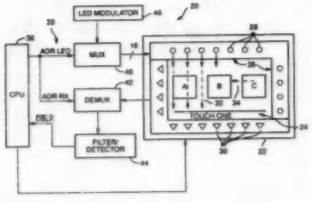
(i) indicating which of the power supplies is operating the valve means.

4,893,120

TOUCH PANEL USING MODULATED LIGHT

Roger W. Doering, Hayward, and Colin F. McManus, Danville, both of Calif., assignors to Digital Electronics Corporation, Hayward, Calif.

Continuation of Ser. No. 935,471, Nov. 26, 1986, abandoned.
This application Nov. 18, 1988, Ser. No. 274,708
Int. Cl.[4] G01V *9/04*
U.S. Cl. 341—31 **9 Claims**



7. A method of locating the position of an object adjacent to a display surface having a defined perimeter, the steps of the method comprising:

providing a multiplicity of light emitting elements and light receiving elements; said elements located so that the light paths defined by selected pairs of light emitting and light receiving elements cross said display surface and define a grid of intersecting light paths thereon;

sequentially energizing selected pairs of said light emitting and light receiving elements;

generating a blocked path signal when the currently enabled light receiving means does not receive the light emitted from the currently enabled light emitting means; and

testing the operability of a selected one of said elements by performing the steps of:

enabling said selected element and a complementary element across said display surface from said selected element, and testing for the presence of a blocked path signal;

enabling the same complementary element and a second element of the same type as said selected element and which is located near said selected element, and testing for the presence of a blocked path signal; and

denoting the detection of a component failure if a blocked path signal is detected when said selected element is en-

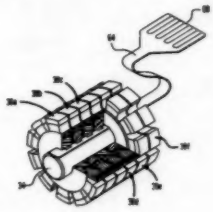
abled, but no blocked path signal is detected when said second element is enabled.

4,893,121

PRINTWHEEL AND ENCODER ASSEMBLY

Donatas V. Gasiunas, Carmel, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 21, 1987, Ser. No. 136,076
Int. Cl.[4] H03M 1/22
U.S. Cl. 341—15 4 Claims



1. A printwheel assembly comprising:

a shaft of non-ferrous material having a slot arranged along the length thereof;

a magnet disposed in said slot;

a plurality of Hall-effect sensors mounted in spaced relation along and juxtaposed to said magnet, each Hall-effect device having leads therefrom;

a plurality of printwheels, each printwheel having a ring of ferrous material molded therein, said ring of ferrous material having a T-shaped cross section, said printwheels being mounted for rotation on said shaft and being located along said shaft in juxtaposition to respective Hall-effect devices on said shaft whereby an output signal on respective leads from each said Hall-effect device will vary in correspondence to the angular position of the respective printwheel; and

means mounted on said shaft and extending therefrom for conducting said signals on said leads outside of said assembly.

4,893,122

PARALLEL ANALOG TO DIGITAL CONVERTER EMPLOYING SAMPLE AND HOLD STAGES

Wolfgang Hoehn, Märgen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

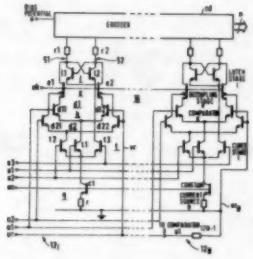
Filed Nov. 25, 1988, Ser. No. 276,258
Claims priority, application European Pat. Off., Dec. 15, 1987, 87118603.7
Int. Cl.[4] H03M 1/36
U.S. Cl. 341—122 12 Claims

1. A parallel analog to digital converter for processing at least two analog inputs, said converter having at least one quantizing means for quantizing the analog inputs into at least one discrete output, and an encoder means for converting the output of said at least one discrete output into digital data, each of said at least one quantizing means comprising:

comparator means having a common reference voltage and at least two differential amplifier circuits, the input side of each of said at least two differential amplifier circuits being connected to a corresponding analog input, and the reference side of both being connected to the common reference voltage, wherein each of said at least two differential amplifier circuits compares . its associated analog input to the reference voltage and generates at least one discrete output therefrom;

latch means for storing the output of said comparator means, the outputs of each of said at least two differential amplifier circuits being connected in parallel to the input of said latch means; and

timing circuit means for selecting one differential amplifier circuit to compare its analog input to the reference voltage, output its results to the encoder means and store the results in said latch means, and for selecting the latch means to output its stored results to the encoder means;



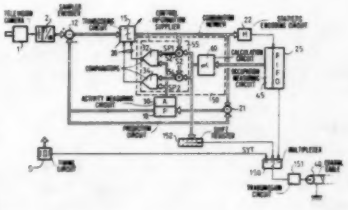
whereby said timing circuit means sequentially selects each of said at least two differential amplifier circuits, one at a time, first generating at least one discrete output to the encoder means, and then outputting the stored results of said latch means to the encoder means, thereby multiplexing and converting the at least two analog signals into a stream of continuous digital data.

4,893,123

TRANSMISSION SYSTEM HAVING A DIFFERENTIAL PULSE CODE MODULATION ENCODING APPARATUS AND AN ASSOCIATED DECODING APPARATUS

Jean-Yves Boisson, Clamart, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1987, Ser. No. 50,181
Claims priority, application France, May 23, 1986, 86 07392
Int. Cl.[4] H03M 3/04
U.S. Cl. 341—143 6 Claims



1. A differential pulse code modulation encoding apparatus comprising:

an input for receiving an input signal to be encoded;

a difference circuit coupled to said input for forming a differential signal, having a number of binary elements, from the difference between said input signal and a prediction signal;

a transmission prediction circuit for forming said prediction signal, said transmission prediction circuit being coupled to an input of said difference circuit;

a transmission transcoding circuit coupled to an output of said difference circuit for reducing said number of binary elements in said differential signal as a function of a control information;

a statistic encoding circuit coupled to an output of said transmission transcoding circuit for variable word length

coding of an output signal of said transmission transcoding circuit;

a buffer memory circuit coupled to an output of said statistic encoding circuit for storing encoded output words from said statistic encoding circuit and for supplying said stored encoded output words to an output of said apparatus;

an activity measuring circuit coupled to said transmission prediction circuit and to said output of said transmission transcoding circuit for generating an activity information; and

an occupation measuring circuit coupled to said buffer memory circuit for generating an occupation information of said buffer memory circuit, characterized in that said encoding apparatus further comprises:

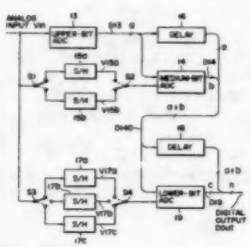
a combining circuit coupled to an output of said activity measuring circuit and an output of said occupation measuring circuit for supplying said control information to a control input of said transmission transcoding circuit in response to said activity information and said occupation information.

4,893,124

PIPELINED SERIAL-PARALLEL A/D CONVERTER

Kazuhiro Tsuji; Tetsuya Iida, and Naoki Sugawa, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 2, 1988, Ser. No. 163,025
Claims priority, application Japan, Mar. 4, 1987, 62-47733
Int. Cl.[4] H03M *1/14*
U.S. Cl. 341—156 **20 Claims**



1. An A/D converter for converting an analog input signal into a digital output signal having an n-bit binary code, wherein n, a, and b are positive integers, and n=a+b, and comprising:

first A/D conversion means for A/D-converting the analog input signal into a first digital output corresponding to upper a-bit data of the n-bit digital output signal;

first sample-hold means for sampling a signal level of the analog input signal and outputting a first hold signal;

second sample-hold means for sampling a signal level of the analog input signal and outputting a second hold signal;

first switching means for, in synchronism with the A/D conversion operation of said first A/D conversion means, selecting the second hold signal from said second sample-hold means during a period in which said first sample-hold means samples the signal level of the analog input signal, and selecting the first hold signal from said first sample-hold means during a period in which said second sample-hold means samples the signal level of the analog input signal;

second A/D conversion means for A/D-converting one of the first and second hold signals selected by said first switching means, and outputting a second digital output corresponding to lower b-bit data of the n-bit digital output signal, said first and second digital outputs being combined to provide said n-bit digital output signal; and

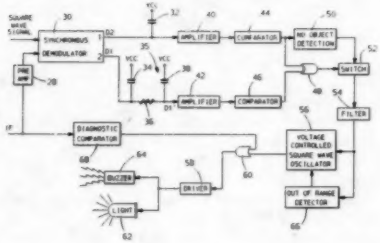
delay means connected to said first A/D conversion means for delaying the first digital output until A/D conversion is completed by said second A/D conversion means, thereby synchronizing the first digital output from said first A/D conversion means to the second digital output from said second A/D conversion means.

4,893,125

VEHICLE DIPLEX DOPPLER NEAR-OBSTACLE DETECTION SYSTEM

Phillip A. May, Lompoc, Calif., assignor to Delco Electronics Corporation, Goleta, Calif.

Filed Nov. 1, 1988, Ser. No. 265,624
Int. Cl.[4] G01S *13/38*
U.S. Cl. 342—129 **3 Claims**



1. A Doppler radar system for a vehicle for indicating a distance between the vehicle and an obstacle as the vehicle approaches the obstacle, the system comprising in combination:

means for transmitting a radar signal alternately at first and second frequencies;

means for receiving the transmitted radar signal reflected from the obstacle;

means for mixing the transmitted and received radar signals to generate first and second Doppler signals having a phase difference that is a measure of the distance to the obstacle and each having a frequency varying directly with the rate that the vehicle is approaching the obstacle;

means for generating a duty cycle signal comprised of repeated pulses having a frequency varying directly with the frequency of the Doppler signals and each having a duration equal to a first time equal to the phase difference between the Doppler signals and therefore being a measure of the distance to the obstacle minus a second time so that the duty cycle signal represents the distance to the obstacle minus an offset distance determined by the second time, the offset distance determined by the second time being directly related to the rate that the vehicle is approaching the obstacle; and

a filter for converting the duty cycle signal to an analog signal having a value representing the distance between the vehicle and the obstacle, the filter having a predetermined time constant resulting in the distance represented by the value of the analog signal being greater than the distance represented by the duty cycle signal by an amount directly related to the rate that the vehicle is approaching the obstacle, the second time being equal to a predetermined constant value so that the offset distance is substantially equal to the lag in the distance represented by the value of the analog signal, whereby the analog signal provides an indication of the distance to the obstacle.

4,893,126

INTEGRATED MILLIMETER-WAVE TRANSCEIVER

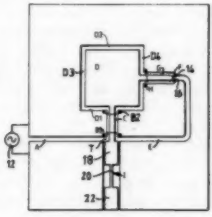
David H. Evans, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,138

Claims priority, application United Kingdom, Sep. 23, 1987, 8722412

Int. Cl.[4] G01S 7/42

U.S. Cl. 342—175 7 Claims



1. A microwave CW transceiver comprising a monolithic integrated circuit including:

a. an annular slot antenna having first and second feed points, said first feed point being coupled to a portion of the antenna which is adapted to radiate energy in a first polarization, and said second feed point being coupled to a portion of the antenna which is adapted to receive energy of a second polarization orthogonal to the first polarization;

b. an RF source coupled to the first feed point for applying to the antenna RF energy to be transmitted in the first polarization; and

c. a balanced mixer coupled to the second feed point and to the RF source for mixing at least a portion of the received energy of the second polarization with coupled energy from the RF source.

4,893,127

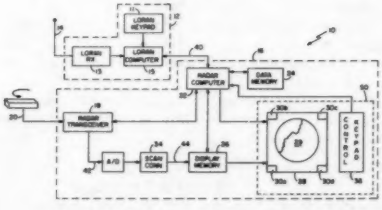
RADAR NAVIGATION SYSTEM

Stanley L. Clark, Derry; Carsten H. Peters, and Jack R. Trommer, both of Bedford, all of N.H., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 12,095, Feb. 6, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,890

Int. Cl.[4] G01S 1/08

U.S. Cl. 342—386 4 Claims



1. A method for displaying information used by a navigator in navigating a vessel, comprising the steps of:

obtaining from a Loran unit electronic representations of the vessel's present position, the present course of the vessel, and the position of a waypoint;

generating a radar image including navigation obstructions in the area surrounding the vessel, the radar image also including a point corresponding to the vessel's present position and a point substantially dead ahead of the vessel;

providing a display of the radar image together with a numeric representation of the present course, the numeric representation of the present course being displayed adjacent the point on the radar image dead ahead of the vessel;

overlaying a heading line on the display, the heading line having as endpoints the point corresponding to the vessel's present position and the point substantially dead ahead of the vessel;

overlaying a graphic indication of the waypoint's position on the display; and

overlaying a waypoint bearing line on the display, the waypoint bearing line having as endpoints the point corresponding to the vessel's present position and a point adjacent the graphic indication of the waypoint's position wherein the navigator is provided with the heading line, the bearing line to the waypoint, and navigation obstructions all on the display so that when the navigator deviates from the waypoint bearing to steer around navigation obstructions, there is a clear visual indication of that deviation by comparing the heading line with the waypoint bearing line.

4,893,128

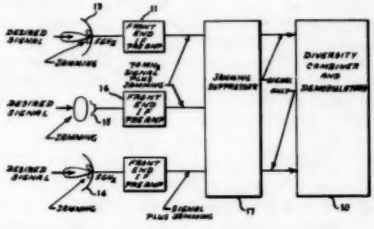
TROPOSCATTER DIVERSITY SIDELOBE JAMMING SUPPRESSOR

Steen A. Parl, Cambridge, and John N. Pierce, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 29, 1979, Ser. No. 97,589

Int. Cl.[4] G01S 3/16; H04B 1/10

U.S. Cl. 342—379 3 Claims



1. In a dual diversity troposcatter link receiver having first and second high gain main antennas and a dual diversity demodulator the improvement residing in a sidelobe jamming suppressor, said sidelobe jamming suppressor comprising

an auxiliary low gain antenna, and

a jamming signal suppressor circuit, said jamming signal suppressor circuit comprising

first, second and third variable attenuators,

first, second, third, fourth, fifth, sixth seventh, eighth, ninth, tenth, eleventh, twelvth, and thirteenth hybrids,

first, second and third clippers,

first, second, third and fourth DC amplifiers,

first, second, third and fourth low pass filters,

first, second, third and fourth multipliers,

first, second, third and fourth mixers,

first and second amplifiers, and

first and second limiting amplifiers,

said first hybrid receiving signals from said auxiliary antenna through said second variable attenuator and feeding said tenth and eleventh hybrids,

said first and third variable attenuators receiving signals from said first and second main antennas respectively and being connected to said dual diversity demodulator, said

first variable attenuator through said second and fourth hybrids and said third variable attenuator through said third and fifth hybrids,

a first feedback loop fed from said fourth hybrid comprising said first limiting amplifier feeding said eighth hybrid, said eighth hybrid feeding in parallel the series connected arrangement of said first mixer, said first low pass filter, said third DC amplifier, said third clipper and said first multiplier and the series connected arrangement of said third mixer, said second low pass filter, said second DC amplifier, said second clipper, and said SECPND multiplier,

a second feedback loop fed from said fifth hybrid comprising said second limiting amplifier feeding said ninth hybrid, said ninth hybrid feeding in parallel the series connected arrangement of said second mixer, said third low pass filter, said third DC amplifier, said third clipper and said third multiplier and the series connected arrangement of said fourth mixer, said fourth low pass filter, said fourth DC amplifier, said fourth clipper, and said fourth multiplier,

said tenth hybrid feeding said first and second mixers through said twelvth hybrid,

said eleventh hybrid feeding said third and fourth mixers through said thirteenth hybrid,

the output of said tenth hybrid being fed through said first multipler, said sixth hybrid, said first amplifier and said second hybrid and also through said third multiplier, said seventh hybrid, said second amplifier and said third hybrid, and

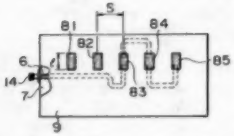
the outputs of said eleventh hybrid being fed through said fourth multiplier, said seventh hybrid, said second amplifier and said third hybrid, and also through said second multiplier, said sixth hybrid, said first amplifier and said second hybrid, said jamming signal suppressor circuit receiving signals from said first and second high gain main antennas and from said auxiliary low gain antenna, said suppressor circuit differencing the signals from each said high gain main antenna with the signal from said low gain auxiliary antenna and inputting the differenced signals to said dual diversity demodulator, the gain of said auxiliary low gain antenna being substantially equal to the sidelobe gain of said high gain main antennor.

4,893,129

PLANAR ARRAY ANTENNA

Masao Kodera, Okazaki, and Seishin Mikami, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 15, 1988, Ser. No. 284,730
Claims priority, application Japan, Dec. 26, 1987, 62-331034
Int. Cl.[4] H01Q 1/38
U.S. Cl. 343—700 MS **5 Claims**



1. A planar array antenna of a series-feed type comprising:

a planar grounding conductor;

a planar first dielectric substrate having said grounding conductor disposed on one of its surfaces;

an elongate feeder line disposed on another surface of said first dielectric substrate to extend from one end to another end of said first dielectric substrate, said feeder line having no branched portion;

a planar second dielectric substrate having one of its surfaces disposed adjacent to said feeder line and said other surface of said first dielectric substrate; and

a plurality of radiation elements for radiating radio frequency power supplied through said feeder line, said radiation elements being arrayed on another surface of said second dielectric substrate so as to be opposite to said feeder line across said second dielectric substrate, said radiation elements being supplied said radio frequency power starting from an end radiation element positioned nearest to a feeding end of said feeder line,

said feeder line having a first feeder part spaced apart by a predetermined distance from a marginal contour of one of said radiation elements in the planar direction of said second dielectric substrate and a second feeder part disposed within a width of a marginal contour of another one of said radiation elements and directly beneath said another radiation element, and said second feeder part being divided into two parts arranged along a longitudinal axis of said feeder line with respective ends thereof confronting each other,

a power coupling coefficient between said second feeder part and said another radiation element being selected to be larger than a power coupling coefficient between said first feeder part and said one of said radiation elements.

4,893,130

ADHESIVE MOUNT MOBILE TELEPHONE ANTENNA

Donald E. Metivier, Denton, Tex., assignor to Decibel Products, Inc., Dallas, Tex.

Filed Mar. 21, 1989, Ser. No. 326,276
Int. Cl.[4] H01A 1/32
U.S. Cl. 343—715 **14 Claims**

1. An antenna mount for adhesive attachment to the surface of a non-conducting body, comprising:

a first electrically conductive member defining a first face and having a plastically deformable neck for coupling to said antenna wherein the orientation said antenna with respect to said surface can be set by plastically deforming said neck;

a first adhesive element for securing said first face to said surface;

a facia ring surrounding said first member and defining a ring face;

a second adhesive element for securing said ring face to said surface, and

a sealant between and bonded to said first member, said ring and said surface for protecting said first adhesive element from damage.

4,893,131

MOBILE OR GROUND MOUNTED ARCUATE ANTENNA

William J. Smith, and Jack M. Smith, both of 4772 Prescot Dr., Bethel Park, Pa. 15102

Filed Jun. 15, 1988, Ser. No. 206,806
Int. Cl.[4] H01Q 1/32, 9/30
U.S. Cl. 343—713 **2 Claims**

1. A transmitting and receiving radio frequency antenna having two spaced, parallel, vertical end portions of equal

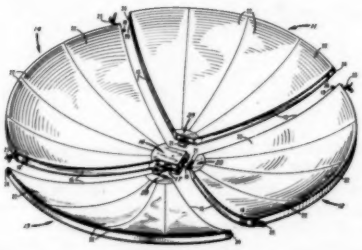
height and an integral intermediate portion bowed upwardly and being of semicircular shape, serving as a radio frequency radiator of wavelengths between about two meters to one hundred-sixty meters comprising a coaxial cable input connector having a grounded outer conductor and an inner conductor connected to a terminal of a high/low frequency switch and a first end of a variable capacitor, said switch arranged to selectively connect said variable capacitor in series with said inner conductor or to short out said variable capacitor so as to connect said first end of said variable capacitor and said inner conductor to a second end of said variable capacitor, said second end of said variable capacitor connected to a first terminal of a variable, tapped tuning and loading inductor and to a variable bandswitch, a second terminal of said inductor connected to one end of one of said vertical end portions at one end of said antenna, and a capacitance coupling connected to an end of a second one of said vertical end portions at the other end of said antenna and coupled to ground, whereby vertical and horizontal polarization is obtained from the shape of said antenna.

4,893,132

ASSEMBLY SYSTEM FOR MAINTAINING REFLECTOR SEGMENTS OF AN ANTENNA IN PRECISION ALIGNMENT

Farhad M. Habibi, Sterling, Va., assignor to Radiation Systems, Inc. Technical Products Division, Sterling, Va.

Filed Oct. 28, 1988, Ser. No. 263,944
Int. Cl.[4] H01Q *15/20*
U.S. Cl. 343—912 **10 Claims**



1. An antenna reflector mounting system for supporting reflector segments in precise alignment comprising:

a master hub member attached at one end thereof to a narrow end of one of said reflector segments, said hub member including a plurality of surfaces equal in number to a remaining number of said reflector segments, aligned along an axis of support of the remaining segments, each of said facing surfaces including:

a central cavity having a rectangular cross-section open to receive a tongue member connected to one of said remaining segments in alignment with an axis thereof, said cavity including adjacent said opening a supporting horizontal bar located adjacent a lower edge of said central cavity;

a tongue member connected in alignment with each of a remaining reflector segment, said tongue member extending downwardly from a connected reflector segment at an angle thereto, said tongue member having a distal end for insertion over said horizontal bar when said reflector segment is inclined downward from its normally aligned position, said tongue member pivoting about said horizontal bar when said reflector segment is raised pulling said antenna segment inward to said aligned position; and,

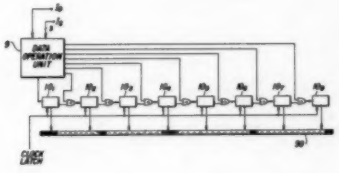
means on a wide end of each antenna segment for holding said segment into alignment with an adjacent segment.

4,893,133

THERMAL PRINTING APPARATUS FOR FORMING A CONTINUOUS TONE DYE IMAGE

Seishi Ohmori, and Wayne F. Niskala, both of Tokyo, Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 138,624, Dec. 28, 1987, abandoned. This application May 25, 1989, Ser. No. 357,655
Claims priority, application Japan, Mar. 6, 1987, 62-51386
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **1 Claim**



1. Thermal printing apparatus for forming a continuous tone dye image composed of dye image pixels, each image pixel having A different possible dye density levels comprising:

a. a thermal print head for printing a line of image pixels, and including a number N of heating elements, each heating element being addressed during A consecutive heating cycles;

b. means for addressing at least one and no more than L consecutive heating elements during any given heating cycle and for addressing at least one different heating element during the next heating cycle, wherein N is at least equal to 2 times L and L and N are integers, said addressing means addressing each heating element A times; and

c. means for selectively energizing each addressed heating element until each heating element delivers sufficient energy to cause a desired amount of dye to be transferred, whereby group line effects are minimized.

4,893,134

THERMAL TRANSFER RECORDING APPARATUS

Junichi Yamamoto; Akihiko Onuma; Kouji Shibuya, and Yasukuni Omata, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

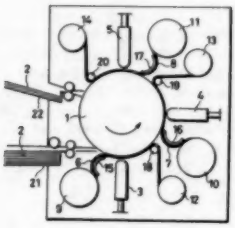
Filed Sep. 2, 1988, Ser. No. 239,760
Claims priority, application Japan, Sep. 4, 1987, 62-222756; Apr. 20, 1988, 63-98807; Jul. 8, 1988, 63-91080[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **16 Claims**

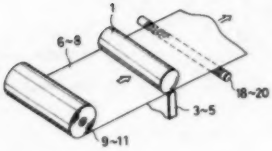
1. A thermal transfer recording apparatus comprising:

a thermal head including a plurality of heating elements arranged in a row;

a platen roller for transporting recording paper to a position opposed to said thermal head;

ink film transport means including a supply reel for supplying an ink film and a takeup reel for taking up the ink film, said ink film transport means transporting the ink film, synchronously with recording paper transportation, to a recording section where said thermal head and said platen roller are opposed to each other; and





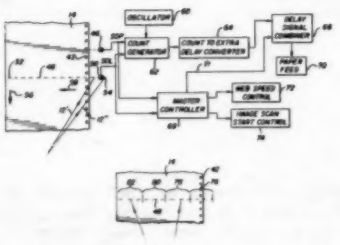
an idle roller slightly spaced from a peripheral surface of said platen roller for contacting a back face of the ink film between said recording section and said takeup reel, said idle roller rotatable with movement of the ink film, and said idle roller including grooves in a grid form on a peripheral surface thereof.

4,893,135

LASER PRINTER WITH POSITION REGISTRATION ENHANCEMENT

Fereidoon S. Jamzadeh, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,075
Int. Cl.[4] G01D *15/14, 9/00;* **H04N** *1/21*
U.S. Cl. 346—108 **15 Claims**



1. A scanning printer for making hard copy documents on a sheet material, said printer comprising:

a movable photosensitive surface;

means for detecting the position of the movable surface;

means for scanning a modulated light beam across said surface while the surface is moving;

means for detecting when the beam is substantially at the beginning of a scan line;

means for feeding a sheet of the document material into an area where a developed image on the surface, previously defined by successive scans of the light beam across the surface, is transferred to the sheet; and

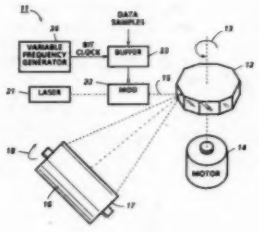
means for delaying the feeding of the sheet from the sheet feeding means, with the delay time being dependent upon a difference in time between the position detection of the photosensitive surface and the detection of the beam, and with the dependency being a function of the position of the beam along a scan line when the movable surface position detecting means signals the start of scanning for defining the image.

4,893,136

ARITHMETICALLY COMPUTED MOTOR HUNT COMPENSATION FOR FLYING SPOT SCANNERS

Douglas N. Curry, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,501
Int. Cl.[4] G01D *15/14;* **H04N** *1/04*
U.S. Cl. 346—108 **1 Claim**



1. In a flying spot scanner having a rotating polygon with a drive motor for cyclically scanning an intensity modulated light beam across a photosensitive recording medium in a line scanning direction while said recording medium is being advanced in an orthogonal process direction, a modulator for modulating said light beam in accordance with data samples representing an image, a buffer for storing said data samples, and an arithmetic frequency synthesizer having an accumulator for recursively accumulating a R-bit long word having a time varying value N at a predetermined reference frequency to generate a variable frequency bit clock for serially shifting said data samples from said buffer to said modulator at a rate controlled by the frequency of said bit clock, the improvement comprising

counter means for accumulating counts during each of said scan cycles at a frequency scaled to said reference frequency, whereby the count accumulated by said counter means during any given scan cycle is a measure of the rotational velocity of said polygon during said given scan cycle,

means for offsetting the accumulated counts by a predetermined bias selected to cause the offset counts to be the accumulator input word values that causes said arithmetic frequency synthesizer to vary the frequency of said bit clock when required for maintaining the bit clock frequency for any subsequent scan cycle multiplied by the rotational velocity of said polygon during at least one preceding scan cycle substantially constant, thereby compensating for any normal polygon motor hunt errors.

4,893,137

RECORDING APPARATUS AND INK CARTRIDGE

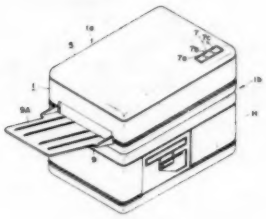
Ryuichi Ebinuma, Kawasaki; Nobutoshi Mizusawa, Yamato, and Yuji Chiba, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 131,083

Claims priority, application Japan, Dec. 10, 1986, 61-292599/1986; Dec. 10, 1986, 61-292600/1986; Dec. 10, 1986, 61-292601/1986; Dec. 25, 1986, 61-307937/1986; Dec. 25, 1986, 61-307938/1986; Dec. 25, 1986, 61-307939/1986; Dec. 25, 1986, 61-307940/1986

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—134 59 Claims



1. A recording apparatus including:

recording means for discharging ink for effecting recording on a recording medium in response to information;

electric circuit means;

an upper unit having said recording means and having at least a portion of said electric circuit means of said recording apparatus;

a lower unit having a platen for maintaining the recording medium in a recording station for effecting recording thereon by said recording means and a position connecting said upper unit and said lower unit being located at the recording station; and

conveying means for conveying the recording medium to the recording station and allowing the recording medium to be conveyed along the position connecting said upper unit and said lower unit at the recording station;

said upper unit and said lower unit being capable of being opened and spaced apart from each other at the position connecting said upper unit and said lower unit at the recording station.

4,893,138

INK JET RECOVERY DEVICE INCLUDING A COMMUNICATING VALVE AND A VENTILATING VALVE

Koji Terasawa, Mitaka; Hideki Yamaguchi, Yokohama; Akira Miyakawa, Tanashi; Shinya Matsui; Mikio Shiga, both of Yokohama, and Shigeru Tsuyukubo, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,527

Claims priority, application Japan, Mar. 13, 1987, 62-58390; Mar. 8, 1988, 63-54279

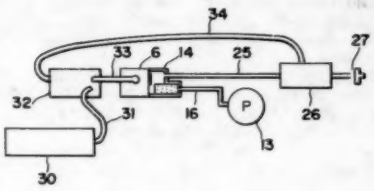
Int. Cl.[4] G01D *15/6;* B41J *3/04*

U.S. Cl. 346—140 R 49 Claims

1. A recovery device for an ink jet recording apparatus having a cap for covering an ink discharge port of a recording head and suction means communicating with the cap for sucking ink from the ink discharge port, said device comprising:

a tube having an interior communicating with the cap and a subtank for supplying ink to the recording head;

a communicating valve for connecting and disconnecting communication of the cap with the subtank provided in an intermediate portion of said tube; and



a ventilating valve communicating the interior of said tube with the atmosphere provided separately from said communicating valve.

4,893,139

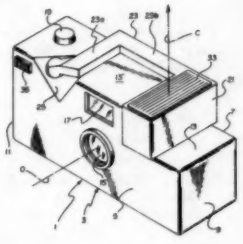
COMPACT CAMERA PROVIDING DIRECT AND INDIRECT FLASH

John H. Alligood, Penfield, and Joel S. Lawther, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,454

Int. Cl.[4] G03B *15/05*

U.S. Cl. 354—149.1 3 Claims



1. An improved photographic camera wherein a flash unit is movable relative to the camera body between an erect position unfolded from said camera body and a storage position folded against the camera body, and wherein the improvement comprises:

said flash unit including a flash light emission window arranged to face generally toward a subject to be photographed when the flash unit is in its erect position, to provide direct illumination of the subject, and arranged to face substantially upward with respect to the subject when the flash unit is in its storage position, to provide direct bounce illumination of the subject.

4,893,140

SINGLE-LENS REFLEX CAMERA WITH BUILT-IN FLASH

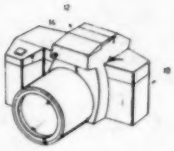
Masato Yamamoto; Susumu Koshino; Toshimasa Yamanaka; Koji Sato; Akihiro Arai, and Masahiro Kionuma, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

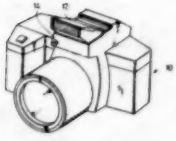
Filed Nov. 24, 1986, Ser. No. 934,055

Claims priority, application Japan, Nov. 22, 1985, 60-261238; Dec. 4, 1985, 60-271373; Dec. 25, 1985, 60-198374[U]; Jan. 31, 1986, 61-11595[U]; Feb. 5, 1986, 61-14482[U]

Int. Cl.[4] G03B *15/03*

U.S. Cl. 354—149.11 **15 Claims**





1. A single-lens reflex camera comprising:

a single-lens camera body having a principal photographic axis;

a pentaprism included in said camera body over said principal photographic axis for operator viewing along said principal photographic axis;

a moveable light emitter built into said camera body, disposed at least partially above said pentaprism and being moveable from an operating position protruded from said camera body to a non-operating position housed in said camera body; and

a lifting mechanism disposed at least partially above said pentaprism for lifting said light emitter to said operating position protruded from said camera body from said non-operating position housed in said camera body, wherein said lifting mechanism includes levers rotatably supported near an upper front face of said pentaprism, said light emitter being rotatably supported at one end of each of said levers, guide grooves located over said pentaprism and extending in a front-to-rear direction of said camera, said light emitter being provided with sliding pins fitted in said grooves, biasing means for biasing at least one of said levers in such a direction as to protrude from said light emitter, and engaging means engaging a portion of said biased lever and releasing same when said light emitter is in the protruded position.

4,893,141

OPEN FRAME SIGHT VIEWFINDER

David C. Smart, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

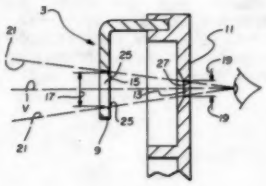
Filed Jan. 30, 1989, Ser. No. 303,613

Int. Cl.[4] G03B *13/04*

U.S. Cl. 354—219 **2 Claims**

1. An improved open frame sight viewfinder for a photographic camera, wherein an aiming sight having a circular-shaped aiming aperture for aiming the camera at a subject to be photographed is positioned forward of a similarly shaped viewing aperture to view the subject simultaneously through the two apertures, and wherein the improvement comprises:

said aiming aperture being dimensioned sufficiently greater than said viewing aperture to approximately encircle the extreme rays of ambient light permitted to pass through the viewing aperture, to prevent said aiming sight substantially from being seen in the viewing aperture when the



camera is correctly aimed at a subject to be photographed, but causing the aiming sight to partially occlude the viewing aperture when the camera is incorrectly tilted relative to the subject.

4,893,142

DEVICE FOR ACTIVATING MOTOR-DRIVEN SHUTTER BLADES

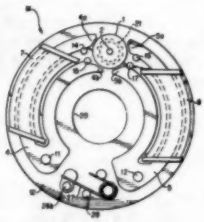
Hiroaki Ishida; Nobuo Shinozaki, and Yasuhiro Nishitani, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,800

Claims priority, application Japan, Nov. 16, 1987, 62-174884[U]; Dec. 26, 1987, 62-198636[U]; Dec. 26, 1987, 62-198637; Dec. 26, 1987, 62-198639[U]; Dec. 26, 1987, 62-198642[U]

Int. Cl.[4] G03B *9/08*

U.S. Cl. 354—234.1 **34 Claims**



1. A device for activating shutter blades relative to a shutter opening and utilizing a control signal from an electronic circuit comprising:

an electric motor rotatable clockwise and counterclockwise according to a control signal from said electronic circuit;

a gear means driven by said motor, said gear means being located on one side of said shutter opening;

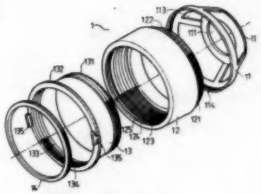
fixed axis means located on an opposite side of said shutter opening opposite to said one side; and

shutter operable means comprising shutter blades pivotable about said fixed axis means, said shutter operable means having gear teeth meshing with said gear means such that said gear means is operable to pivot said shutter blades clockwise and counterclockwise about said axis means to open and close said shutter opening.

4,893,143
LENS BASE AND ITS ACCESSORIES FOR ANY COMPACT AUTOMATIC CAMERA

Wey Sheng-Huei, No. 26 Chiu-Lung Street, Kang-Shan Town, Kaohsiung Hsien, Taiwan

Filed Sep. 16, 1988, Ser. No. 245,160
Int. Cl.[4] G03B 17/00
U.S. Cl. 354—286 10 Claims



1. A mounting arrangement for an automatic camera having a main lens, comprising:

(a) connector means mounted on the camera, and including a connecting member having a central connector hole aligned along a longitudinal axis with the main lens of the camera and a pair of mutually parallel, elongated guide channels at opposite lateral sides of the central connector hole;

(b) a guiding ring including an end wall having a central guide hole aligned along the longitudinal axis with the connector hole, and a pair of guide projections insertable into, and slidable lengthwise along, the guide channels, said guide projections frictionally contacting the guide channels and being frictionally retained in a selected position along the guide channels, said guiding ring having a threaded open end opposite said end wall;

(c) an outer cylindrical ring having a threaded end section for threadedly engaging the threaded open end of the guiding ring, an opposite rim end section, a threaded idling section between the end sections, and a threaded intermediate section adjacent the idling section;

(d) an inner cylindrical ring having a threaded end portion for threadedly engaging the threaded intermediate section of the outer ring, an opposite threaded portion, and a handle portion for turning the inner ring about the longitudinal axis, said inner ring also having projecting arms for holding a photographic element in front of the main lens of the camera; and

(e) a positioning ring threadedly engaging the opposite threaded portion of the inner ring, and retaining the photographic element in position on the inner ring.

4,893,144
CONTINUOUS WEB FORM INSTANT PHOTOGRAPHIC MATERIALS AND METHOD FOR PROCESSING THE SAME

Duncan C. Sorli, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

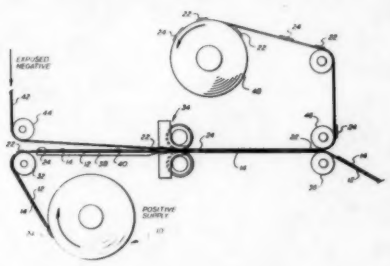
Filed Feb. 21, 1989, Ser. No. 313,162
Int. Cl.[4] G03D 5/02
U.S. Cl. 354—304 11 Claims

1. The method for processing successive image receiving frames of rapid access instant photographic material on a continuous carrier web, said frames each having leading trailing and side edges and being spaced longitudinally on said carrier web, the width of each frame relative to the width of said carrier web providing marginal areas between opposite side edges of said frames and opposite side edges of said carrier web, said method comprising the steps of:

supplying a measured quantity of processing liquid to said leading edge of each of said frames;

releasably securing a residual processing liquid trap to said carrier web near the trailing edge of each of said frames;

passing said carrier web through a processing gap with an image-bearing web overlying said frames and said traps to spread the processing liquid over the area of each of said frames and onto the top surface of said trap;



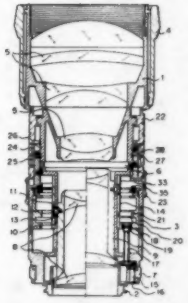
transferring said traps to said image bearing web after passage thereof through said processing gap; and

delivering said processed frames on said carrier web to a user.

4,893,145
FOCUSING OPERATION CHANGEOVER APPARATUS FOR A CAMERA

Atsushi Matsuda, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,700
Claims priority, application Japan, Feb. 5, 1987, 62-25673
Int. Cl.[4] G03B 3/10, 7/02
U.S. Cl. 354—400 19 Claims



1. A focusing operation changeover apparatus adapted for use in a camera, said camera being capable of use in both an automatic focus condition and a manual focus condition, said changeover apparatus comprising:

(a) a group of photographic lenses which are freely moveable in opposite directions along the optical axis of said camera;

(b) automatic focusing means for moving said photographic lenses along said optical axis in accordance with a focusing signal in order to achieve automatic focusing;

(c) a manual focus control ring for moving said group of photographic lenses along said optical axis, said manual control ring being rotatable about said optical axis and being prevented from moving along said optical axis;

(d) a rotatable changeover ring for selectively disconnecting the manual focus control ring from said group of photo-

graphic lenses, wherein said changeover ring and said manual focus control ring comprise separate rings;

(e) means for preventing said manual focus control ring and said changeover ring from rotating when said camera is in said automatic focus condition; and

(f) means for moving said changeover ring between an automatic focus position and a manual focus position irrespective of the position of the photographic lenses.

4,893,146

PAPER SEPARATING CLAW FOR IMAGE FORMING APPARATUS

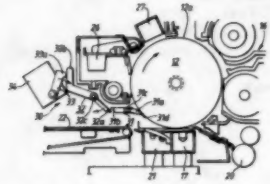
Natsuki Tachibana, Yokohama; Kenshi Toshimitsu, Kawasaki, and Issey Ichihara, Funabashi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

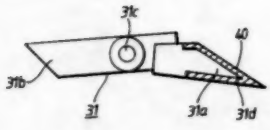
Continuation of Ser. No. 110,876, Oct. 21, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,158

Claims priority, application Japan, Oct. 31, 1986, 61-259714; Oct. 31, 1986, 61-259724

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—315 **11 Claims**





1. An image forming apparatus including a movable image carrier, means for forming an image on the image carrier, and means for transferring the image from the image carrier onto an image bearing sheet while the image bearing sheet is in contact with the surface of the image carrier, the apparatus comprising:

means for separating the image bearing sheet from the image carrier, including a separating claw, the separating claw formed of an elastic synthetic resin composition containing a polyurethane resin; and

means for moving the separating claw between a first position in which the tip of the separating claw is in contact with the surface of the image carrier and a second position in which the separating claw is separated from contact with the surface of the image carrier; wherein the synthetic resin tip of the claw contacts both the surface of the image carrier and the image bearing sheet to be separated therefrom.

4,893,147

COLOR PICTURE IMAGE RECORDING APPARATUS

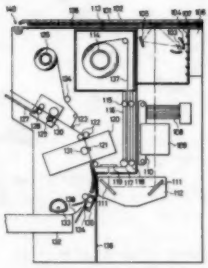
Kazunori Tanabe; Makoto Suzuki; Kazumasa Makino; Eiji Shibata; Kazuhito Ishida; Takashi Nakata, all of Nagoya; Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Mizuho, and Yoichi Horaguchi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 18, 1988, Ser. No. 156,744

Claims priority, application Japan, Feb. 28, 1987, 62-46524; Sep. 25, 1987, 62-241075; Dec. 15, 1987, 62-317848

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—27 **22 Claims**



1. An image recording apparatus for recording on a recording medium an image of an original, said recording medium comprising a first medium having a first surface carrying a first material and a second surface, and a second medium having a first surface carrying a second material and a second surface, said first medium being in the form of an elongated, web-like continuous sheet and said second medium being in the form of a cut sheet, said apparatus comprising:

means for exposing said first medium to an image bearing light to form a latent image thereon corresponding to said image of said original;

means for developing said latent image according to a reaction of said first material with said second material to form a visible image on said first surface of said second medium;

means for introducing said first and second mediums into said developing means, said first surface of said first medium and said first surface of said second medium being held in facial contact with each other when introduced thereinto;

means for separating said second medium from said first medium after being subjected to development by said developing means; and

means for conveying said second medium with said first surface of said second medium face-up.

4,893,148

METHOD FOR STORING DRY SILVER SALT ROLL FILM FOR ROTARY TYPE MICROPHOTOGRAPHY AND ROTARY TYPE MICROPHOTOGRAPHY CAMERA SYSTEM

Masahiko Sanada, Matsudo; Yoshio Hayashi, Fuji; Akira Ohnuma, Fuji, and Shuichiro Ogawa, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

PCT No. PCT/JP87/00066, § 371 Date May 3, 1988, § 102(e) Date May 3, 1988, PCT Pub. No. WO88/01758, PCT Pub. Date Mar. 10, 1988

PCT Filed Jan. 31, 1987, Ser. No. 199,041

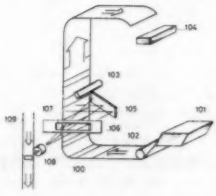
Claims priority, application Japan, Sep. 4, 1986, 61-206739

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—27 **47 Claims**

1. A rotary type microphotography camera system, comprising:

(a) a storage means for storing an unexposed roll film;
(b) an unwinding means for unwinding said unexposed roll film from said storage means;
(c) a light source for emitting light for illuminating an original to be exposed;
(d) an optical means for illuminating said original by the light emitted from said light source under a condition that the travel of said original is synchronized with the unwinding of said unexposed film and for imaging the output light from said original on the surface of said unexposed roll film at a reduced size;



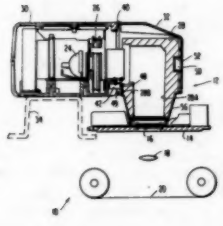
(e) a heating means for heating said roll film thus exposed by said optical means to thermally develop said roll film;
(f) a monitor means for measuring, immediately after the thermal development, the optical density of said roll film thermally developed by said heating means to monitor the storage conditions of said unexposed film substantially simultaneously with the exposure and the thermal development; and
(g) a discharging means for discharging said thermally developed roll film.

4,893,149

PHOTOGRAPHIC PRINTING APPARATUS

Hiroyuki Satou, and Junichi Tsuji, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 19, 1989, Ser. No. 299,096
Claims priority, application Japan, Jan. 20, 1988, 63-10382
Int. Cl.[4] G03B *27/54, 27/72*
U.S. Cl. 355—67 **18 Claims**



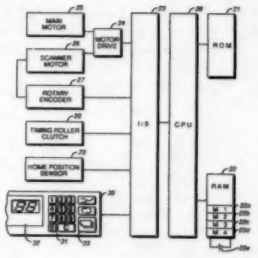
1. A photographic printing apparatus arranged to diffuse light emitted from a light source and irradiate a negative film with said light diffused, for printing an image from said negative film, comprising:
means for accommodating said light source;
means for diffusing light emitted from said light source, said diffusing means being swingable with respect to said accommodating means; and
mounting means for mounting detachably said diffusing means in said mounting means and for being swingable between an exposure-light guiding position and an out-of-optical-path position, said mounting means being swingably attached to said accommodating means.

4,893,150

COPIER

Yoshikado Yamada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 18, 1988, Ser. No. 273,808
Claims priority, application Japan, Nov. 20, 1987, 62-294378
Int. Cl.[4] G03B *27/00*
U.S. Cl. 355—243 **3 Claims**



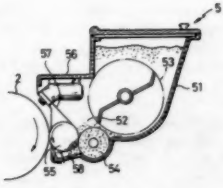
1. A copier comprising
an optical scanner,
paper supplying means for supplying a copy paper sheet to have an image transferred thereonto,
input means for inputting displacement values measured during an adjustment mode of operation of said copier at two magnification values between the position of a target image with respect to a scanned original document and the position of a copied image of said target image with respect to a copy paper sheet,
calculating and storing means for calculating timing values for determining the timing for supplying a copy paper sheet with respect to the action of said optical scanner on the basis of measured values inputted by said input means and storing said calculated timing values, and
driving means for driving said paper supplying means according to a timing based on said timing values stored in said calculating and storing means.

4,893,151

IMAGE DEVELOPING APPARATUS

Mutsuki Yamazaki, Yokohama; Kaoru Oshima, Tokyo, and Toshimasa Takano, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 25, 1988, Ser. No. 276,416
Claims priority, application Japan, Nov. 26, 1987, 62-296022; Nov. 30, 1987, 62-302011; Nov. 30, 1987, 62-302015; Nov. 30, 1987, 62-302016
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—245 **20 Claims**



1. An image developing apparatus, comprising:
image bearer means for bearing a latent image;
toner conveyer means for conveying non-magnetic single component toner to the image bearer means in order to

develop the latent image, the toner conveyer means having its surface coated with a ceramic; and

lamination controller means for controlling a thickness of non-magnetic single component toner lamina to be formed on the toner conveyer means.

4,893,152

COPYING APPARATUS HAVING A SORTER WITH A SHEET BINDING FUNCTION

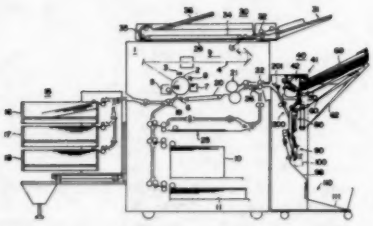
Kuniaki Ishiguro, and Takuma Ishikawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kasha, Osaka, Japan

Filed Sep. 13, 1988, Ser. No. 243,797

Claims priority, application Japan, Sep. 16, 1987, 62-231500; Sep. 16, 1987, 62-231501

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—323 **3 Claims**



1. A copying apparatus comprising:

image forming means for copying an original image onto a predetermined number of sheets;

sorting means for distributing the sheets ejected from said image forming means to a plurality of bins;

binding means for binding the sheets taken-out from each of the bins;

a first path for transporting sheets having an original image formed thereon by said image forming means from the image forming means to said sorting means;

a second path for transporting the sheets having an original image formed thereon by said image forming means from the image forming means to said binding means;

diverting means for diverting the sheets to either said first path or said second path;

inputting means for inputting the number of copy sets to be prepared from one original;

designation means for designating a sorting mode;

a first control means for controlling said diverting means to conduct sheets to said first path in accordance with the designation of the sorting mode; and

second control means for controlling said diverting means to conduct sheets to said second path regardless of said first control means when the input number of copy sets is 1.

4,893,153

COLLATION OF MULTI-PAGE DOCUMENTS

Milton S. Sales, and John R. Thompson, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,850

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—325 **8 Claims**

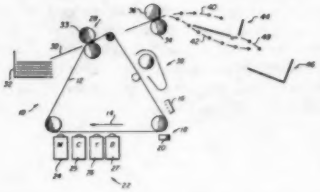
1. In an electrostatographic machine adapted to reproduce multi-original documents containing interleaved types of originals requiring skip frame cycles between types, the improvement comprising:

means for reproducing all originals of one type;

means for storing the reproductions of the originals of said one type;

means for reproducing all the originals of the other type; and

means, operative during the reproduction of the originals of said other type, for delivering the reproductions of said one type original seriatim from said storage means into the reproduction document in collated fashion at the position



corresponding to the position of the associated original in the multi-original document.

4,893,154

ELECTROLUMINESCENT DEVICE

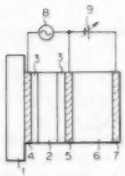
Yutaka Hirai, Tokyo; Masafumi Sano, Kawasaki; Hisanori Tsuda, Atsugi, and Katsuji Takasu, Asaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 170,634, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 842,240, Mar. 21, 1986, abandoned. This application Feb. 8, 1989, Ser. No. 309,023

Claims priority, application Japan, Mar. 28, 1985, 60-62088

Int. Cl.[4] H01L *27/12*

U.S. Cl. 357—4 **5 Claims**



1. An electroluminescent device, which emits light by recombination of the carriers injected or excited by light or energy of electrical field said electroluminescent device comprising:

an active layer at least a part of which is a non-monocrystalline semiconductor layer of a super-lattice structure having an effective band gap; and

electrodes for applying variable voltage to said non-monocrystalline semiconductor layer of said super-lattice to change the effective band gap of the semiconductor layer.

4,893,155

HETEROJUNCTION FIELD EFFECT TRANSISTOR DEVICE AND PROCESS OF FABRICATION THEREOF

Keiichi Ohata, Tokyo, Japan, assignor to General Electric Company, Schenectady, N.Y.

Filed May 16, 1988, Ser. No. 194,370

Claims priority, application Japan, May 14, 1987, 62-11590

Int. Cl.[4] H01L *29/80, 29/225*

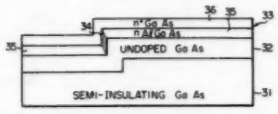
U.S. Cl. 357—22 **5 Claims**

1. A heterojunction field effect transistor fabricated on a semi-insulating substrate, comprising:

(a) a first layer overlying said semi-insulating substrate and formed of a first high-purity compound semiconductor material, said first layer having a lower portion, an upper portion and a first shoulder portion interconnecting the lower and upper portions;

(b) a second layer topographically overlying said first layer so that a step configuration of said first shoulder portion is

transferred to said second layer to form lower and upper portions formed of a second compound semiconductor material and a second shoulder portion interconnecting the lower and upper portions and formed of a fourth compound semiconductor material, said second compound semiconductor material being smaller in electron affinity than said first high-purity compound semiconductor material, said fourth compound semiconductor material being smaller in electron affinity than said first high-purity compound semiconductor material but larger in electron affinity than said second compound semiconductor material, an active channel layer taking place in said upper portion of said first layer along a heterojunction formed between said first layer and said second layer;



(c) a source contact region formed on the lower portion of said second layer so as to be in contact with said second shoulder portion, said source contact region being formed of a third compound semiconductor material;

(d) a drain region formed on the upper portion of said second layer so as to be electrically coupled to said active channel layer, said drain region being spaced from said source region; and

(e) a gate electrode formed on the upper portion of said second layer, said gate electrode being biased to control said active channel layer, wherein said fourth compound semiconductor material has a lower edge of a conduction band higher in energy level than that of said first high-purity compound semiconductor material but lower in energy level than that of said second compound semiconductor material.

4,893,156

MOS FET DEVICE

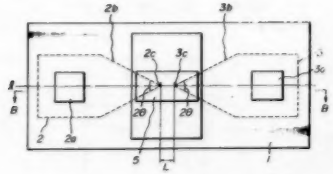
Shinji Karasawa, Matori, Japan, assignor to Miyagi National College of Technology, Miyagi, Japan

Filed Mar. 7, 1988, Ser. No. 165,077

Claims priority, application Japan, May 28, 1987, 62-129872

Int. Cl.[4] H01L *29/78, 29/06*

U.S. Cl. 357—23.1 **11 Claims**



1. A MOS FET device comprising a semiconductor substrate of one conductivity type, a source layer of the other conductivity type formed in the substrate, a drain layer of the other conductivity type formed in the substrate with a gap from the source layer, a drain electrode applied on the drain layer, a channel region being defined in the substrate between said source layer and said drain layer, an insulating film overlying the channel zone, and a gate electrode applied on the insulating film so as to face the channel region via the insulating film, at least one of the source and drain layers having a tapered portion whose diminished edge extends into the channel zone so as to face the other one of the source and drain layers, wherein the diminished edge of said at least one of the source and drain layers is separated from the other one of the source and drain layers by such a gap L that a carrier moving speed in the channel zone is saturated when a sourcedrain voltage higher than a threshold value is applied across the source and drain electrodes.

4,893,157

SEMICONDUCTOR DEVICE

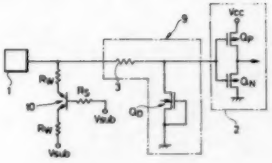
Kazuyuki Miyazawa, Kodaira; Yasunori Yamaguchi, Tachikawa, and Hiroshi Kawamoto, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

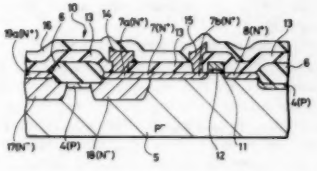
Continuation of Ser. No. 764,072, Aug. 9, 1985, abandoned. This application Dec. 23, 1987, Ser. No. 136,939

Claims priority, application Japan, Aug. 24, 1984, 59-174947

Int. Cl.[4] H01L *29/78, 27/02, 29/72*

U.S. Cl. 357—23.13 **33 Claims**





1. A semiconductor device comprising an internal circuit having a plurality of MISFETs and an input protective circuit which has a resistor and wherein destruction of at least one of said plurality of said MISFETs in said internal circuit is prevented, said semiconductor device comprising:

a semiconductor substrate having a first and a second portion, each having a first conductivity type, in order to form said input protection circuit and said internal circuit, respectively;

a first semiconductor region of a second conductivity type, formed inside said first portion, said first semiconductor region including said resistor, and wherein one end portion of said first semiconductor region is connected directly to an input terminal by an aluminum layer and another end portion of said first semiconductor region is connected to a gate electrode of one of said plurality of MISFETs of said internal circuit;

a second semiconductor region of a second conductivity type, formed inside said first portion, said second semiconductor region being deeper than said first semiconductor region and source and drain regions of said MISFETs in said internal circuit, and having a lower impurity concentration than the source and drain regions of said MISFETs in said internal circuit, said second semiconductor region being in contact with and disposed below said one end portion of said first semiconductor region; and

a third semiconductor region of the second conductivity type, formed inside said first portion, said third semiconductor region being disposed adjacent to said second

semiconductor region and separated from said second semiconductor region by a predetermined distance so that said second and third semiconductor regions at said first portion constitute a transistor for preventing the destruction of said at least one of said plurality of MISFETs.

4,893,158

MOSFET DEVICE

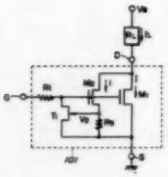
Teruyoshi Mihara, Yokosuka; Yukitsuga Hirota, Kamakura; Yukio Hiramoto, Tokyo, and Tsutomu Matsushita, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 20, 1988, Ser. No. 209,237

Claims priority, application Japan, Jan. 22, 1987, 62-153479; Sep. 8, 1987, 62-223018; Sep. 9, 1987, 62-224063; Sep. 9, 1987, 62-224064

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.13 **30 Claims**



1. A MOSFET device comprising

a main MOSFET component having source, drain and gate electrodes,

a protective circuit having a monitor MOSFET component having a gate electrode, a source electrode and a drain electrode which is connected with said drain electrode of said main MOSFET component, a monitor resistor connected between said source electrodes of said main and monitor MOSFET components, a first branch connecting said gate electrodes of said main and monitor MOSFET components, and a protective transistor having a first electrode connected with said gate electrode of said main MOSFET component, a second electrode and a control electrode connected with a node between said monitor resistor and said source electrode of said monitor MOSFET component.

4,893,159

PROTECTED MOS TRANSISTOR CIRCUIT

Youichi Suzuki; Makoto Segawa, both of Yokohama; Shoji Arizumi, Tokyo; Takeo Kondo, Yokosuka, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 910,663, Sep. 23, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 219,805

Claims priority, application Japan, Sep. 25, 1985, 60-211419

Int. Cl.[4] H01L *29/78, 27/02, 29/04*

U.S. Cl. 357—23.13 **8 Claims**

1. A protected MOS transistor circuit comprising:

a semiconductor substrate with a top surface;

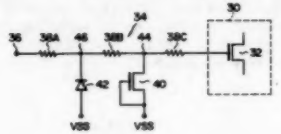
an input terminal supplied with an input voltage signal;

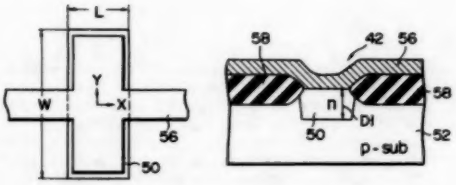
an input MOS transistor including an insulated gate and also including source and drain regions formed in the top surface of said semiconductor substrate;

an impurity-doped semiconductor layer insulatively formed over said top surface of said substrate and connected between said input terminal and said insulated gate of said input MOS transistor, said semiconductor layer acting as a transfer line for transferring said input voltage signal to the insulated gate of said input MOS transistor;

first diode means connected in a reverse-biased orientation between a power source terminal and a first portion of said semiconductor layer; and

second diode means also connected in the reverse-biased orientation between said power source terminal and a second portion of said semiconductor layer which is located closer to said input terminal than said first portion of said semiconductor layer, said second diode means having a diffusion region formed in the top surface of said semiconductor substrate and extending laterally in a transverse direction to said semiconductor layer such that said diffusion region is longer in a transversal direction of said semiconductor layer than in a longitudinal direction of said layer, said diffusion region, together with said semiconductor substrate, constituting a pn junction;





wherein said second portion of said semiconductor layer is elongated in the transversal direction of said semiconductor layer and contacts substantially the entire top surface of said diffusion region.

4,893,160

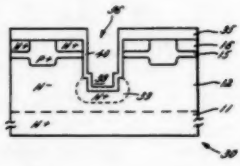
METHOD FOR INCREASING THE PERFORMANCE OF TRENCHED DEVICES AND THE RESULTING STRUCTURE

Richard A. Blanchard, Los Altos, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Filed Nov. 13, 1987, Ser. No. 120,395

Int. Cl.[4] H01L *29/78, 29/06*

U.S. Cl. 357—23.4 **8 Claims**



1. A semiconductor device comprising:

a first region of semiconductor material, doped to a first concentration with a dopant of a first conductivity type, and serving as a drain region;

a trench formed within said first region, said trench having sides and a bottom;

a second region of semiconductor material located within said first region and adjacent to said trench near said bottom of said trench, said second region being of said

first conductivity type and having a higher dopant concentration than said first region;

a gate electrode within said trench; a layer of gate dielectric insulating said gate electrode from said first and second regions;

a source region formed on the surface of said first semiconductor region; and

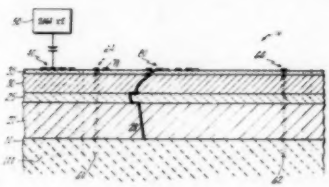
a body region within said first region beneath said source region, said body region having a second conductivity type opposite said first conductivity type.

4,893,161

QUANTUM-WELL ACOUSTIC CHARGE TRANSPORT DEVICE

William J. Tanski; Sears W. Merritt, and Robert N. Sacks, all of Glastonbury, Conn., assignors to United Technologies, Hartford, Conn.

Filed Sep. 24, 1987, Ser. No. 100,795
Int. Cl.[4] H01L *29/78, 27/14, 29/205, 45/00*
U.S. Cl. 357—24 **3 Claims**



1. An integrated electronic acoustic charge transport device comprising:

a substrate defining a horizontal plane;

charge transport layer of piezoelectric semiconductive material, having a transport layer thickness and a transport layer conduction band potential, disposed above said semiconducting substrate and having a predetermined relationship thereto;

surface acoustic wave means disposed above an insulating support means and mechanically connected to said charge transport layer, for passing acoustic waves along a predetermined path in said charge transport layer;

electron confinement means for preventing the escape of electrons from said predetermined path;

electron supply means for supplying and maintaining a predetermined concentration of supply electrons in the conduction band of said charge transport layer, whereby at least some of said supply electrons are carried along said predetermined path in electron packets, having an average electron wavelength, by an electric potential traveling with said acoustic wave; and

control means for controlling the passage of selected electron packets along said path, characterized in that:

said charge transport layer has a first conduction band potential and is positioned vertically between lower and upper confinement semiconductor layers, each having a higher conduction band potential than said transport layer conduction band potential; and

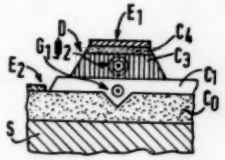
said transport layer thickness is such that a potential well extends through said transport layer, whereby said electron packets are confined vertically in said charge transport layer by said potential well and said transport layer thickness is less than 50 nm.

4,893,162

INTEGRATED SEMICONDUCTOR ARRANGEMENT OF THE COUPLING TYPE BETWEEN A PHOTODETECTOR AND A LIGHT WAVEGUIDE

Jean-Louis Gentner, Saint-Maur, and Marko Erman, Paris, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 29, 1987, Ser. No. 81,212
Claims priority, application France, Jul. 9, 1986, 86 09984
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **11 Claims**



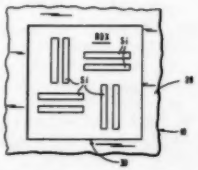
1. An integrated semiconductor device of the type for coupling between a photodetector D and a light waveguide G_1, operating within a band of given wavelengths, containing on the surface of a semiconductor substrate S of a III-V compound a confining layer C_0 of a III-V compound and a transparent layer C_1 of a III-V compound, transparent layer C_1 being transparent for the operating wavelengths and having an index superior to that of the confining layer, the light waveguide G_1 being disposed in layer C_1, and also containing an absorbing layer C_3 of a III-V compound, for the operating wavelengths, having an index superior to that of the waveguide, in which later C_3 the photodetector is formed, characterized in that the absorbing layer C_3 is deposited on top of the transparent layer C_1 such that the photodetector is formed on the surface of the light waveguide G_1 and coupled to said waveguide G_1 in parallel with the axis of G_1 over a given coupling length L_2 which is a function of the amount of light issued by the waveguide G_1 and received by the photodetector.

4,893,163

ALIGNMENT MARK SYSTEM FOR ELECTRON BEAM/OPTICAL MIXED LITHOGRAPHY

Paul J. Rudeck, Bronx, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1988, Ser. No. 173,832
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—40 **4 Claims**



1. A semiconductor wafer comprising:

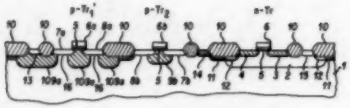
a series of semiconductor devices produced on said wafer, and a series of alignment marks etched into said wafer in alignment with and bordered by an isolation level oxide.

4,893,164

COMPLEMENTARY SEMICONDUCTOR DEVICE HAVING HIGH SWITCHING SPEED AND LATCHUP-FREE CAPABILITY

Takehide Shirato, Hiratsuka, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 178,788, Apr. 1, 1988, abandoned, which is a continuation of Ser. No. 786,939, Oct. 11, 1985, abandoned. This application May 5, 1989, Ser. No. 348,132
Claims priority, application Japan, Oct. 13, 1984, 59-214617
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 **5 Claims**



2. A complementary semiconductor device having a high speed operating capability and a high integration density, formed in a semiconductor substrate having a first conductivity type, on which an input/output circuit operatively connectable to an external circuit is formed in a peripheral area thereof, and an inner circuit operatively connected to said input/output circuit is formed in an inner area thereof, said complementary semiconductor device, comprising:

a field insulation layer formed over a surface of said semiconductor substrate for defining transistor regions in which MIS field effect transistors are formed and electrically separating said transistors from each other by surrounding each of said MIS field effect transistor regions;

a well region of a second conductivity type formed in said semiconductor substrate, said well region having a higher dopant concentration than that of said semiconductor substrate, and extending beneath said field insulation layer, wherein said first conductivity type is opposite to said second conductivity type;

a first impurity region of said first conductivity type formed in said semiconductor substrate, and extending beneath a part of said field insulation layer, said first impurity region having a higher dopant concentration than that of said substrate including a plurality of empty portions selectively formed in said first impurity region, wherein said first impurity region is absent from said plurality of empty portions;

a second impurity region of said first conductivity type formed in said substrate, said second impurity region having a higher dopant concentration than that of said semiconductor substrate;

a first conductivity type channel MIS field effect transistor formed in said well region of said second conductivity type and having a source region, a drain region, and a channel region, all of which are formed in said well region;

a second conductivity type channel MIS field effect translator of a first type formed in said semiconductor substrate, and having a source region, drain region and channel region which are formed in said first impurity region, wherein at least a portion of each of said drain region and said source region formed in at least one empty portion in said first impurity region to thereby have said portion of each of said drain region and said source region directly contact said semiconductor substrate for increasing switching speed of said second conductivity type channel MIS field effect transistor of a first type;

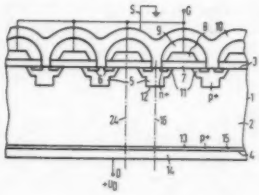
a second conductivity type channel MIS field effect transistor of a second type formed in said substrate and having a source region and drain region formed directly in said substrate and a channel region substantially located at said second impurity region to thereby increase switching speed of said second conductivity type channel MIS field effect transistor of a second type, wherein said second conductivity type channel MIS field effect transistor of said first type and said first conductivity type channel MIS field effect transistor are selectively disposed in said input-/output circuit, and said second conductivity type channel MIS field effect transistor of said second type and said first conductivity type channel MIS field effect transistor are disposed selectively in said inner circuit.

4,893,165

BIPOLAR TRANSISTOR CONTROLLABLE BY FIELD EFFECT

Gerhard Miller, Penzing; Helmut Strack, and Jenoe Tihanyi, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 313,045
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805799
Int. Cl.[4] H01L *29/78, 29/74*
U.S. Cl. 357—43 **11 Claims**



1. An improved field-effect controllable bipolar transistor having a field effect transistor structure with a source side and a drain side, the improvement, comprising:

a semiconductor body on which the field effect transistor structure is formed having an inner zone in which life time of minority charge carriers in at least 1 microsecond,

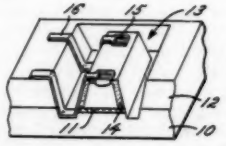
a zone at the drain side of said semiconductor body with higher doping than said inner zone and of an opposite conductivity type, said drain side zone being less than 1 micrometer thick and being doped with implanted ions of a dose between 1×10^{12} and 1×10^{15} cm^{-2}.

4,893,166

HIGH VALUE SEMICONDUCTOR RESISTOR

James Geekie, Santa Clara, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Division of Ser. No. 88,157, Aug. 21, 1987, Pat. No. 4,843,027.
This application Feb. 21, 1989, Ser. No. 313,737
Int. Cl.[4] H01L *27/04*
U.S. Cl. 357—51 **10 Claims**



1. A semiconductor structure comprising:

a sublayer formed of semiconductor material of a first conductivity type;

a semiconductor layer of said first conductivity type formed on said sublayer;

a groove formed in said semiconductor layer substantially to

said sublayer, thereby forming an island of said semiconductor layer;

a peripheral region of said island of said semiconductor layer, formed as the top and sides of said island, said peripheral region being doped to a second conductivity type opposite said first conductivity type; and

an isolation region formed in said sublayer beneath said island of semiconductor material, said isolation region being of said second conductivity type,

whereby a central portion of said island remains doped to said first conductivity type,

whereby said central portion of said island serves as a resistor and said peripheral portion of said island is junction isolated from said central portion.

4,893,167

METHOD FOR PROGRAMMABLE LASER CONNECTION OF TWO SUPERIMPOSED CONDUCTORS OF THE INTERCONNECT SYSTEM OF AN INTEGRATED CIRCUIT

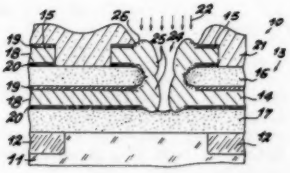
Alain Boudou, Vert, and Marie F. Bonnal, Fortenay Le Fleury, both of France, assignors to Pull S.A., Paris, France

Continuation of Ser. No. 71,473, Jul. 9, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 319,911

Claims priority, application France, Jul. 11, 1986, 86-10205

Int. Cl.[4] H01L *27/02, 29/06, 23/48*

U.S. Cl. 357—51 **12 Claims**



1. An integrated circuit device comprising an interconnect system including a first conductor of a multilayered structure comprising a strip of a metal having a predetermined melting point sandwiched between lower and upper films of a material having a substantially higher melting point than said predetermined melting point of said strip of metal, a dielectric layer disposed over said first conductor, a second conductor having a multilayered structure comprising a strip of a metal having a predetermined melting point sandwiched between lower and upper films of a material having a substantially higher melting point than said predetermined melting point of said strip of said metal, a passivation layer disposed over the second conductor, an opening formed by laser beam through the passivation layer, the second conductor, the dielectric layer and at least partially the first conductor, and a connection in said opening comprising a first and second bead and extending from and between the first and second conductors, wherein each of said first and second beads comprises said metal and said material having a substantially higher melting point than that of said metal.

4,893,168

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING BONDING PADS AND FABRICATING METHOD THEREOF

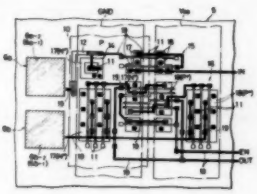
Yoshikazu Takahashi, Shiga; Tsuneo Itoh, Kokubunji, and Makoto Takechi, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,680

Claims priority, application Japan, Jun. 22, 1981, 56-95357

Int. Cl.[4] H01L *27/02, 21/44*

U.S. Cl. 357—68 **24 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor substrate;

a plurality of $I/\overline{O}$ cells formed on said semiconductor substrate, each of said $I/\overline{O}$ cells including predetermined circuit elements capable of being interconnected to provide at least one of the circuit functions of an input circuit, an output circuit and an input/output circuit;

a plurality of bonding pads formed on said semiconductor substrate corresponding to respective $I/\overline{O}$ cells, with each $I/\overline{O}$ cell having at least two independent bonding pads in correspondence therewith, the number of bonding pads exceeding the number of $I/\overline{O}$ cells, said at least two bonding pads being adjacent to each other; and

a wiring pattern for providing each of said $I/\overline{O}$ cells with at least two selected circuits of said input, output and input-/output circuits, said wiring pattern including an interconnection for electrically connecting each of said $I/\overline{O}$ cells with at least two of said corresponding bonding pads to extract said two selected circuits from each $I/\overline{O}$ cell.

4,893,169

LEAD FRAME AND A PROCESS FOR THE PRODUCTION OF A LEAD WITH THIS LEAD FRAME

Helmut Rusch; Guenter Waitl; Hansjoerg Harrasser, all of Regensburg; Hans-Juergen Richter, Planegg, all of Fed. Rep. of Germany; Lee Francis, Melaka, Malaysia; Alois Seidl, Regensburg, Fed. Rep. of Germany; Hans Wissinger, Regensburg, Fed. Rep. of Germany, and Hans-Joachim Hampel, Regensburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 895,626, Aug. 11, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 181,881

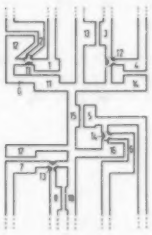
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534916

Int. Cl.[4] H01L *23/48, 33/00*

U.S. Cl. 357—70 **5 Claims**

1. A lead frame carrier for semiconductor chips for encapsulation into a package, the lead frame carrier comprising a patterned area for a plurality of semiconductor chips including a plurality of first electrical leads each one of the plurality of semiconductor chips having a first electrical lead extending outward from a region selected for encapsulation to provide a plurality of external leads, the patterned area including a common conductor having a plurality of semiconductor chip receiving areas within the region and extending outward from the region to provide at least one external connection, a plurality of connecting points located in the region, each connecting

point connected between at least one of said first electric leads and the common conductor for providing mechanical rigidity for the lead frame carrier through their connections and each



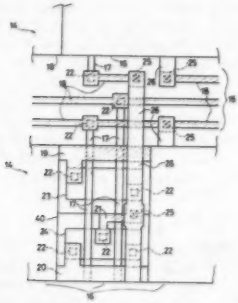
connecting point having a reduced cross sectional area coupling between the common conductor and each one of the selected electrical leads.

4,893,170

SEMICONDUCTOR DEVICE WITH MULTI-LEVEL WIRING IN A GATE ARRAY

Takeshi Tokuda, Osaka; Jirou Korematsu, Itami, and Osamu Tomisawa, Nishinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,064
Claims priority, application Japan, Jun. 24, 1983, 58-114602
Int. Cl.[4] H01L *27/10, 29/52*
U.S. Cl. 357—71 **17 Claims**



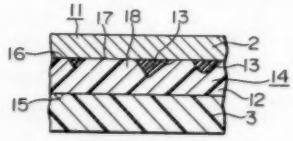
1. A semiconductor device of a multiple-layer wiring structure comprising:
- a plurality of logic gate cells;
- a wiring channel-containing wiring connections between said logic gate cells;
- vertical wirings each of which is contained in a vertical wiring layer;
- horizontal wirings each of which is contained in a horizontal wiring layer;
- either of said vertical or horizontal wiring layers being provided in plurality;
- wirings of one of said wiring layers that is provided in plurality being used as wirings for input terminals of logic gates of said logic gate cell and being connected to other wirings in said wiring channel;
- another wiring layer of one of said wiring layers that is provided in plurality being used as wirings for output terminals of logic gates of said logic gate cell connected to other wires in said wiring channel where said wirings are disposed along a wiring grid in said wiring channel;
- said wiring grid being established for each of said wiring layers that is provided in plurality so that the lines of different ones of said grids are alternately arranged.

4,893,171

SEMICONDUCTOR DEVICE WITH RESIN BONDING TO SUPPORT STRUCTURE

Masahiko Denda, Itami, Japan, assignor to Director General, Agenty of Industrial Science and Technology, Japan

Division of Ser. No. 175,182, Mar. 30, 1988, Pat. No. 4,871,405.
This application Nov. 29, 1988, Ser. No. 277,639
Int. Cl.[4] H01L *23/28*
U.S. Cl. 357—72 **4 Claims**



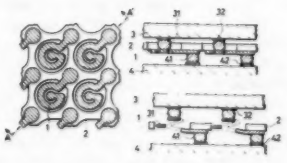
1. A semiconductor device comprising:
- a semiconductor element;
- a support structure for supporting said semiconductor element; and
- a bonding layer, disposed between said semiconductor element and said support structure, bonding said semiconductor element to said support structure, said bonding layer having first and second bonding surfaces to which said semiconductor element and said support structure are respectively bonded,
- said bonding layer comprising a first resin layer composed of a first bonding agent having a first hardness and a first viscosity, said first resin layer having an irregular free surface including projections and cavities therein and forming part of one of said bonding surfaces; and
- a second resin layer having a hardness less than the first hardness and a viscosity less than the first viscosity disposed on said first resin layer in the cavities filling said cavities and forming with said projections one of said bonding surfaces.

4,893,172

CONNECTING STRUCTURE FOR ELECTRONIC PART AND METHOD OF MANUFACTURING THE SAME

Kunio Matsumoto; Muneo Oshima, both of Yokohama, and Suguru Sakaguchi, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 143,200
Claims priority, application Japan, Jan. 19, 1987, 62-8004
Int. Cl.[4] H01L *23/36, 23/48, 21/603*
U.S. Cl. 357—79 **20 Claims**



1. A connecting structure for an electronic part comprising:
- said electronic part having at least an electrode;
- a substrate to be electrically connected to said electrode of said electronic part; and
- a lead member having a planar shape of a curved line, and a width greater than a thickness of said lead member, and

said lead member being connected between said electrode and said substrate such that said electronic part and said substrate are mutually deformable relative to one another in any of a horizontal and vertical direction.

4,893,173

LOW-INDUCTANCE SEMICONDUCTOR APPARATUS

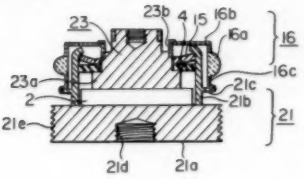
Mituo Ohdate, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 55,542, May 29, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 289,441

Claims priority, application Japan, Jun. 4, 1986, 61-129665; Jun. 4, 1986, 61-129666

Int. Cl.[4] H01L *21/603, 25/14, 23/04*

U.S. Cl. 357—79 **5 Claims**



1. A semiconductor apparatus comprising:

an electrically-conducting base which has a flat upper surface and which serves as a first electrode;

a cylindrical casing secured to the upper surface of said base in an airtight manner and protruding from said base;

a semiconductor element which is disposed inside said casing on the upper surface of said base in electrical contact therewith;

a second electrode, the height of which is substantially equal to its diameter, disposed on said semiconductor element opposite said base inside said casing in electrical contact with said semiconductor element, said second electrode containing a threaded hole and having a flat upper surface from which said threaded hole into which an electrical lead can be screwed is accessible, said second electrode having a ledge proximate said base;

pressing means for pressing said second electrode against said semiconductor element, said pressing means including a disc spring of a non-magnetic material disposed around said second electrode, within and engaging the inside of said casing, and an electrical insulator disposed between and in contact with said disc spring and said ledge within said casing; and

a cap having a top surface and an opposed lower portion including a hole in the center of said top surface, the inner periphery of the hole in said cap being secured to said second electrode in an airtight manner and the lower portion of said cap being secured to said cylindrical casing in an airtight manner.

4,893,174

HIGH DENSITY INTEGRATION OF SEMICONDUCTOR CIRCUIT

Minoru Yamada, Iruma; Akira Masaki, Musashino; Kazuo Sato, and Yutaka Harada, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

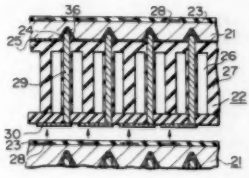
Continuation of Ser. No. 883,529, Jul. 8, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 240,443

Claims priority, application Japan, Jul. 8, 1985, 60-148393; Jul. 10, 1985, 60-150100

Int. Cl.[4] H01L *25/04, 29/06, 23/16*

U.S. Cl. 357—82 **41 Claims**

1. An integrated circuit structure formed by stacking a plurality of semiconductor substrates, in a thickness direction, in such a manner that an insulating board is sandwiched between adjacent semiconductor substrates, wherein a semiconductor substrate and an insulating board have substantially the same size; wherein said insulating board includes a coolant path, in said insulating board, said coolant path including a groove in the insulating board for passing a coolant therethrough, the groove being provided by walls formed in the insulating board; and wherein both the semiconductor substrate and the insulating board include a plurality of electrical communication paths which respectively pierce said semiconductor substrate and the insulating board in the thickness direction, said electrical communication paths piercing the semiconductor substrate including a conductive member provided in an anisotropic etch pit which is formed in the semiconductor substrate, said



semiconductor substrate having first and second main surfaces, opposite to each other in said thickness direction, said conductive member provided in said anisotropic etch pit electrically connecting the first main surface of the semiconductor substrate, where a circuit element is formed, to the second main surface of the semiconductor substrate, said pit being made by a process including the step of boring a hole under a highly-doped layer which is part of said circuit element, from the second main surface of said semiconductor substrate to said highly-doped layer, by an anisotropic etching method, and the electrical communication paths piercing the insulating board including conductive portions extending on the walls, providing the groove, formed in the insulating board.

4,893,175

VIDEO SIGNAL TRANSMISSION SYSTEM WITH REDUCED NUMBER OF SIGNAL LINES

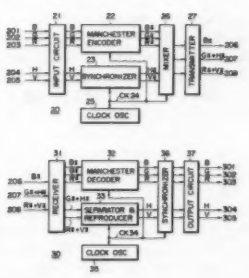
Akio Fukada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 3, 1987, Ser. No. 128,278

Claims priority, application Japan, Jan. 30, 1987, 62-18616

Int. Cl.[4] H04N *11/06*

U.S. Cl. 358—12 **62 Claims**



1. A signal transmission system for transmitting main signals and sub signals from a transmitter part to a receiver part through signal transmission lines, wherein said transmitter part comprises:

modulation means for modulating the main signals by a predetermined modulation method which allows separa-

tion of the main signals from the sub signals, and outputting modulated main signals;

mix means, coupled to said modulation means, for mixing the sub signals with the modulated main signals, and outputting three transmission signals each of said transmission signals having any one of three separate modulated main signals, two of said three transmission signals having a separate sub signal, which is a sync signal, mixed with the modulated main signal; and

transmission means, coupled to said mix means, for transmitting the transmission signals onto said signal transmission lines.

4,893,176

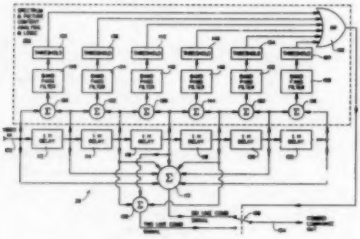
ADAPTIVE COMB FILTER FOR QUADRATURE MODULATED COLOR TELEVISION SYSTEMS

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Continuation of Ser. No. 87,614, Aug. 20, 1987, abandoned, which is a continuation of Ser. No. 785,880, Oct. 9, 1985, abandoned. This application May 11, 1988, Ser. No. 193,230

Int. Cl.[4] H04N *9/78, 11/14*

U.S. Cl. 358—31 **5 Claims**



1. A method for encode-decode processing of a quadrature modulated color television picture signal including a luminance component and a chrominance component which is amplitude modulated in phase quadrature upon a suppressed subcarrier, to reduce cross-color and cross-luminance artificacts in a resultant signal to be displayed, the method including in an encoding process the steps of:

comb filtering the quadrature modulated chrominance component in a comb filter structure including an adaptively selectable number of n delays, where n is equal to an integer lying in a range between 2 and 13 and the delay is a predetermined one of line scan period, frame scan period, and frame/line scan periods, the number n being adaptively selected in relation to chrominance/luminance spectral overlap in an incoming video signal in order to put out a comb filtered chroma component;

processing the luminance component by passing the luminance component through two complementary filters both symmetrically centered about a chrominance component subcarrier frequency, one filter comprising a band pass filter and the other filter comprising a band reject filter; comb filtering the luminance signal passing through the band pass filter in a comb filter structure including an adaptively selectable number of n delays, where n is equal to an integer and the delay is the same predetermined one of line scan period, frame scan period, and frame/line scan periods the number n being adaptively selected in relation to chrominance/luminance spectral overlap in an incoming video signal in order to produce a comb filtered high frequency luminance signal; and adding in phase the comb filtered high frequency luminance signal and the signal passing through the band reject filter in order to provide a comb filtered full bandwidth luminance signal; and,

combining in phase the comb filtered chroma component and the comb filtered full bandwidth luminance signal in order to provide a composite signal to a path;

the method including within a decoding process the steps of:

receiving the composite signal from the path;

comb filtering the composite signal received from the path in a comb filter structure including n delays, where n is equal to an integer and the delay period is the same predetermined one of said line scan period, frame scan period, and frame/line scan periods in order to separate a received chrominance component and a received luminance component; and,

decoding said comb filter separated chrominance component and said comb filter separated luminance component to recover said resultant signal to be displayed.

4,893,177

APPARATUS AND A METHOD FOR GENERATING MANUSCRIPTS TO REPRODUCE A COLOR PRINT

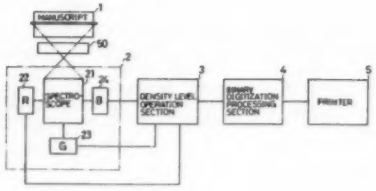
Kaoru Tada, and Masaaki Oyabu, both of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1986, Ser. No. 937,510

Claims priority, application Japan, Dec. 5, 1985, 60-273772

Int. Cl.[4] H04N *1/387*

U.S. Cl. 358—75 **27 Claims**



1. An apparatus for effecting an optical scanning of a full color manuscript, for separating an optical image thereof into three primary color images, for reading each image, and for outputting data for each image thus read to a thermal printer so as to generate a print associated with each primary color obtained by the color separation, comprising:

means for effecting an optical scanning of the full color manuscript;

means including a spectroscope for effecting a color separation of an optical image obtained by optically scanning the full color manuscript;

a plurality of photoelectric transducer means for conducting a photoelectric conversion for each color of light to generate an electric signal corresponding to a density level at each pixel of the image associated with each separated color;

means for processing each electric signal to generate binary data for the image to be outputted to a thermal printer, said means adapted to process the electric signals according to an area gradation method that includes reducing the density level of each color at each pixel location by an amount corresponding to a density level common to each separated color and multiplying said electric signals by a factor of decimal fraction corresponding to the number of color images used so that a total of dots in a pixel associated with each color is at most a total of matrix elements in the pixel and the dots of each color are arranged in the pixel so as not to cause an overlap therebetween in the pixel; and

control means for controlling the output of the binary data for each color to the thermal printer.

4,893,178

SIMULATOR FOR AUTOMATIC PHOTOGRAPHIC PRINTING APPARATUS INCLUDING INVERSION CIRCUITRY AND SPECTRAL CHARACTERISTIC COMPENSATION

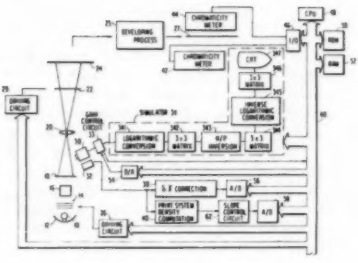
Toru Matama; Kenji Suzuki; Koji Takahashi, and Tsuneo Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 29, 1987, Ser. No. 78,956

Claims priority, application Japan, Jul. 29, 1986, 61-178293; Sep. 3, 1986, 61-207564; Sep. 26, 1986, 61-227377; Jun. 18, 1987, 62-152161

Int. Cl.[4] G03F *3/08*

U.S. Cl. 358—76 18 Claims



1. A simulator for use in an automatic photographic printing apparatus of the type in which a photographic paper is exposed to a negative image carried by a negative film by means of a light source system controlled by an automatic exposure control function of the automatic photographic printing apparatus, said simulator being adapted to display a positive image corresponding to said negative image in accordance with an output signal from an image pickup device which picks up said negative image when said negative film is illuminated by said light source system, said simulator comprising:

first conversion means receiving said output signal from said image pickup device;

inversion means coupled to an output from said first conversion means;

second conversion means coupled to an output from said inversion means; and

display means coupled to an output from said second conversion means;

said inversion means inverting said output from said first conversion means so as to produce a positive image corresponding to said negative image;

said display means displaying a compensated positive image in accordance with the output from said second conversion means; and

said first conversion means and said second conversion means together effecting compensation for any difference between an integrated density of said negative image relative to the spectral sensitivity of said image pickup device and an integrated density of said negative image relative to the spectral sensitivity of said photographic paper, and substantially equalizing first tristimulus values associated with spectral emission characteristics of a fluorescent substance on said display means with second tristimulus values associated with dye absorption characteristics of a print obtained from the photographic paper.

4,893,179

DIGITAL COLOR COPYING MACHINE

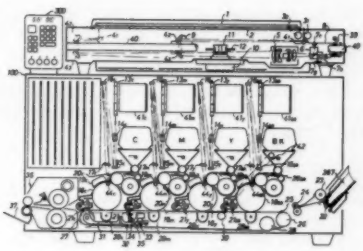
Takanori Ito, Kanagawa, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

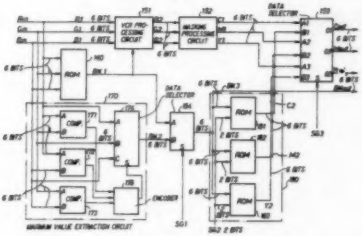
Filed Mar. 31, 1988, Ser. No. 176,298

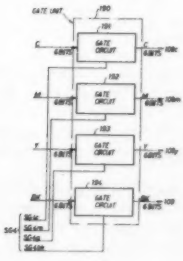
Claims priority, application Japan, Apr. 1, 1987, 62-80794

Int. Cl.[4] G03F *3/08*; H04N *1/46*; G03G *15/01*

U.S. Cl. 358—79 3 Claims







1. A digital color copying machine comprising:

a color-decomposing means for color-decomposing color image projected thereto into three fundamental colors and generating three digital color signals corresponding respectively to said three fundamental colors;

a color conversion means connected to said color-decomposing means for extracting a black component and one signal with the greatest density level from said three digital color signals and generating a plurality of fundamental color signals corresponding to said three digital color signals, a first signal corresponding to said black component and a second signal corresponding to said one signal;

an image recording means connected to said color conversion means for recording on a predetermined medium images in the color corresponding to at least one of said

fundamental color signals, said first signal and said second signal supplied thereto from said color conversion means respectively; and

a control means connected to said color conversion means for controlling signals delivered by said color conversion means such that said color conversion means delivers to said image recording means a plurality of said fundamental color signals and said first signal when said image recording means records said images in a plurality of colors corresponding to a plurality of said fundamental color signals and said first signal, delivers to said image recording means said second signal when said image recording means records said images in the color corresponding to said second signal, and delivers to said image recording means said first signal when said image recording means records said images in the color corresponding to said first signal.

4,893,180

COLOR IMAGE SIGNAL PROCESSING METHOD

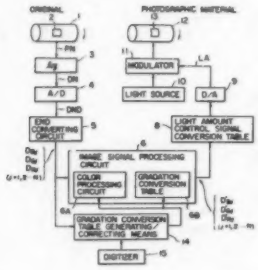
Takao Shigaki; Osamu Shimazaki, and Hitoshi Urabe, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 928,824, Nov. 10, 1986, abandoned. This application Apr. 6, 1989, Ser. No. 334,758

Claims priority, application Japan, Nov. 9, 1985, 60-251573

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—80 **5 Claims**



1. A color image signal processing method for a color image input/output system which is adapted to read an original by an image input section, to correct in color and gradation thus obtained image signals, and to feed output density signals for each color to an image output device, which comprises the steps of;

calculating differences (ΔD_B, ΔD_G, ΔD_R) between desired finish densities and the output density signals (D_i) at specified points on said original which are obtained by converting input density signals at said specified points based upon reference gradation conversion curves;

preparing characteristic curves ($f(D_i)$) of said differences with respect to said output density signals utilizing a same function for the respective colors, said same function satisfying specified restraint conditions;

preparing corrected gradation conversion curves by adding said reference gradation conversion curves to said functions; and

determining said functions so that said corrected gradation conversion curves F_i are within a specified inclination range ($F_{imin} < F_i < F_{imax}$), wherein F_{imin} is a minimum inclination and F_{imax} is a maximum inclination;

thereby correcting a gradation conversion table as well as correcting a color correction table by limiting the values of color correction coefficients so as to remove color distortion of output images.

4,893,181

INTERACTIVE IMAGE MODIFICATION

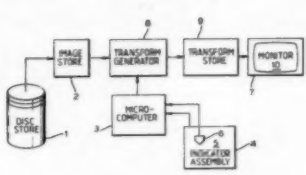
Andrew J. V. Yeomans, Hertfordshire, England, assignor to Crosfield Electronics Limited, London, England

Filed Oct. 3, 1988, Ser. No. 252,405

Claims priority, application United Kingdom, Oct. 2, 1987, 8723203

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—80 **6 Claims**



5. Apparatus for interactively modifying an image represented by digital data defining the colour component content of pixels of the image, the apparatus comprising an image store for storing the said digital data; a display; retouching means defining retouch curves for each colour component; and control means for applying said image in said image store to said retouching means and thereafter to said display to display the retouched image and for modifying said retouch curves, wherein said control means modifies said retouch curves so that a second selected image point is retouched to the colour of a first selected image point by modifying a colour component retouch curved for each colour component used to define the original image such that a pixel located at said second selected point will be retouched to have the colour content of a pixel at the first selected point.

4,893,182

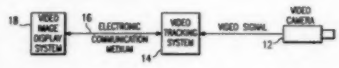
VIDEO TRACKING AND DISPLAY SYSTEM

Michael G. Gautraud, Muskegon, Mich.; Thomas M. Buie, Richardson, and Mark F. Blessing, Dallas, both of Tex., assignors to Micronyx, Inc., Richardson, Tex. and Brunsick Bowling & Billiards Corporation, Muskegon, Mich.

Filed Mar. 18, 1988, Ser. No. 170,268

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—105 **26 Claims**



1. An image processing system for displaying a succession of selected separated images of a moving object moving in an otherwise substantially static scene, comprising:

an image sensor for generating video signals of the static scene and for generating video signals of the static scene including the object moving therethrough, said video signals being generated over a plurality of frames;

first memory means for storing video signals of at least one of said plurality of frames from the static scene;

second memory means for storing video signals of said plurality of frames from the static scene including the object moving therethrough;

means for comparing on a frame-by-frame basis said video signals stored in said first memory means with said video signals stored in said second memory means to thereby determine the presence of the object in each of said plurality of frames; and

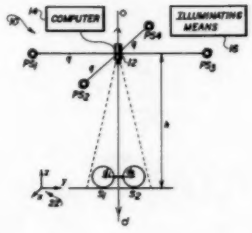
means for displaying the location of the object in each of said plurality of frames.

4,893,183

ROBOTIC VISION SYSTEM

Shree K. Nayar, Pittsburgh, Pa., assignor to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Aug. 11, 1988, Ser. No. 231,180
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—107 7 Claims



1. A robotic vision system for identifying the location of objects comprising:

means for recording images;

n elements where n≧2, and is an integer, each of said n elements disposed at a predetermined position such that each of the n elements is in view of the recording means and reflections of objects from each of the n elements is directly received by the recording means; and

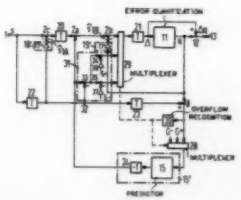
means for determining the locations of objects from the image received by the recording means, said recording means connected to the determining means to provide the viewed image thereto.

4,893,184

ARRANGEMENT FOR DPCM-CODING WITH HIGH DATA RATE

Hans-Juergen Mattausch, Brunnthal-Faistenhhar; Fred Matthiesen, and Matthias Schoebinger, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 346,084
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820234
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—135 16 Claims



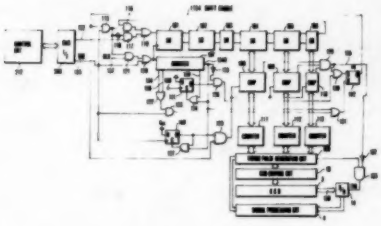
1. An arrangement for DPCM coding with high data rate, whereby prediction values are subtracted from digitized picture element signals at an input (1) and difference signals thus obtained are utilized for signal transmission after a processing, the arrangement having a recursive signal path that has a first adder (8) for forming reconstructed picture element signals (s_R), a predictor (10) for the formation of estimated values, and a first means for subtraction (2*a*) for the formation of the difference signals, comprising, for processing the difference signals, the difference signals are supplied to a first input of a second adder (12) via a means for outputting a quantization error (11) pertaining to a difference signal of the difference signals; a second input of the second adder (12) receiving the difference signals, signals for signal transmission being taken at an output (13) of the second adder (12); an output of the means for outputting a quantization error (11) of a difference signal connected to a first input of the first adder (8), a second input of the first adder (8) receiving the digitized picture element signal; and an output of the first adder (8) connected to the first subtraction means (2*a*) via the predictor (10).

4,893,185

IMAGE SENSING APPARATUS

Nobuo Fukushima, and Makoto Kondo, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 100,594, Sep. 24, 1987, abandoned. This application May 13, 1989, Ser. No. 352,605
Claims priority, application Japan, Sep. 30, 1986, 61-232019
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.17 10 Claims



1. An image sensing apparatus comprising:

a memory arranged to store defect position data representing the corresponding positions to all defects existing in an image sensor;

a cyclic register arranged to temporarily store a plurality of defect position data stored by said memory;

a comparator arranged to compare one defect position data stored by said register with the scanning position of said image sensor; and

correcting means arranged to correct the output of said image sensor in accordance with the output of said comparator.

4,893,186

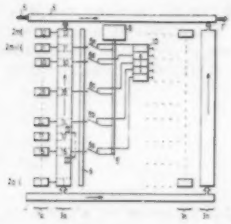
IMAGE PICKUP DEVICE WITH EXPOSURE CONTROL BASED ON PIXEL SAMPLES

Hendrik Mulder, Delft, Netherlands, assignor to B.V. Opische Industrie "De Oude Delft" , Delft, Netherlands

Filed Feb. 8, 1988, Ser. No. 153,249
Claims priority, application Netherlands, Feb. 16, 1987, 8700372
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.19 19 Claims

1. Image pickup device comprising a matrix having horizontal rows and vertical columns of image pickup elements, means for supplying clock signals to said matrix of image pickup elements to shift image information in a column direction in time-delay-and-integration mode, and means for repeatedly reading said image information out of a column, which comprises means for determining amount of charge stored in prede-

termined image pickup elements in a column and means for removing said charge in only said predetermined image pickup



elements of said column when said detected amount exceeds a predetermined limit value.

4,893,187

IMAGE PROCESSING APPARATUS

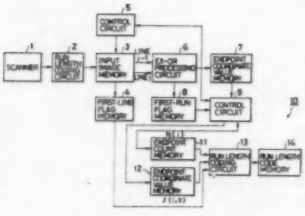
Shuichi Tsujimoto, and Haruo Asada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 13, 1988, Ser. No. 205,774

Claims priority, application Japan, Sep. 30, 1987, 62-246138

Int. Cl.[4] H04N *1/419*

U.S. Cl. 358—261.1 **15 Claims**



9. An image processing method for carrying out a run length coding in a first direction on original image data to obtain input image data and carrying out an image process in a second direction on the obtained input image data, comprising the steps of:

(a) coding the original image data with run length codes in the first direction to obtain input image data;

(b) storing the input image data in memory means;

(c) sequentially reading, from the memory means, data of every two lines which are adjacent to each other in the second direction perpendicular to the first direction; and

(d) carrying out an exclusive OR operation on the read data of the every two lines, to detect second directional end-point positions of the original image data without decoding the input image data into the original image data.

4,893,188

DOCUMENT IMAGE ENTRY SYSTEM

Tatsuya Murakami, Tachikawa; Hiromichi Fujisawa, Tokyo; Masaaki Fujinawa, Tokorozawa, and Toshihiro Hananoi, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 208,116

Claims priority, application Japan, Jun. 19, 1987, 62-151108

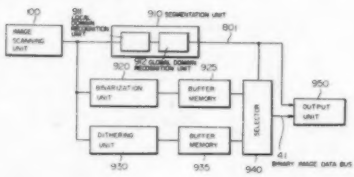
Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—456 **16 Claims**

1. An image input apparatus comprising:

an image scanning unit for effecting a scanning on a surface of a sheet of paper to convert an optical image on the sheet into halftone or multivalue digital image data;

a local recognition unit for effecting a scanning on an image attained by said image scanning unit by use of a window including M×N (M and N are integers) pixels such that a feature value is extracted depending on a state of a density distribution of pixels in the window and a recognition to determine whether each of said pixels belongs to a binary domain or a halftone domain is effected according to said feature value; and



a large scale recognition unit for subdividing the image in block each including P×Q (P and Q are integers and P>M, Q>N) pixels such that depending on a feature value represented by an output result from said local recognition unit with respect to each pixel of each block, whether said each block belongs to a binary domain or a halftone domain is recognized in a real-time processing;

wherein recognition of whether each portion of said image belongs to a binary domain or halftone domain is effected only depending on partial data of said image.

4,893,189

PORTABLE IMAGE SCANNER

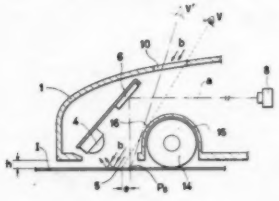
Mineo Kubota, Yamanashi, and Kenji Masuyama, Kofu, both of Japan, assignors to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Filed Jun. 30, 1988, Ser. No. 214,050

Claims priority, application Japan, Sep. 11, 1987, 62-139893[U]

Int. Cl.[4] H04N *1/024*

U.S. Cl. 358—471 **10 Claims**



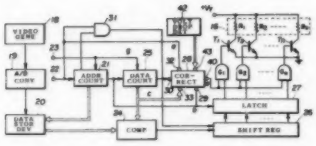
1. A portable image scanner comprising a light source for illuminating an reading portion to be read on an objective image plane, a reflecting member for refracting image light reflected in a substantially vertical direction from the reading portion, an image sensor which receives said image light sent through said reflecting member and is adapted to convert said image light to corresponding image data signals, a housing accommodating said light source, reflecting member and image sensor, and a sub-scanning drive member for allowing the scanner to move in a sub-scanning direction, said housing being provided at its lower surface with a reading aperture and at its upper surface with a peep hole displaced to the image sensor side with respect to a portion substantially right above said reading aperture so as to form a viewing path inclined against said image sensor side.

4,893,190

GRADATION CONTROL DEVICE FOR THERMAL INK-TRANSFER TYPE PRINTING APPARATUS

Itsuo Takanashi, Kamakura; Hideshi Tanaka; Terumi Ohara, both of Yokohama; Kenichi Miyazaki, Yokohama; Toshinori Takahashi, Kawasaki; Hiroki Kitamura, Tokyo; Tadao Shinya, and Yutaka Mizoguchi, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 15, 1987, Ser. No. 96,659
Claims priority, application Japan, Sep. 19, 1986, 61-221634
Int. Cl.[4] H04N 1/40, 1/21, 1/23
U.S. Cl. 358—298 7 Claims



1. A gradation control device for a thermal ink-transfer type printing apparatus, said printing apparatus comprising a power source and a thermal printing head coupled to said power source through a transmission path and provided with n heating elements arranged in line, said n heating elements heating an ink film coated with a kind of ink which melts due to heat and transferring the melted ink onto a recording sheet which makes contact with the ink film to print images line by line, said gradation control device comprising:

memory means for storing at least n digital data of natural binary code which represent gradation levels with which a printing is to be carried out;

control data producing means including comparing means repeatedly supplied with the n digital data from said memory means in response to a clock pulse signal having a constant repetition frequency m times in a time period in which one line is printed and means for generating a reference printing density datum a value of which is changed every time the n digital data are supplied to said comparing means once, said comparing means being supplied with said reference printing density datum so as to compare the n digital data with said reference printing density datum, said control data producing means producing control data in a form of a serial n-bit data signal having a constant bit rate in accordance wth said constant repetition frequency every time the n digital data are supplied to said comparing means once, each control datum constituting the serial n-bit data signal having a logic value "1" or "0" depending on whether or not each value of the n digital data is greater than or equal to the value of said reference printing datum;

serial-to-parallel converting means for converting said n-bit data signal into a parallel n-bit data signal;

voltage drop detecting means for detecting a voltage drop caused in a supply voltage to said thermal printing head and for producing a voltage drop datum dependent on the detected voltage drop;

heating pulse generating means for generating m heating pulses for printing one line, said m heating pulses having pulse widths which are available as a function of the value of the reference printing density datum and said voltage drop datum; and

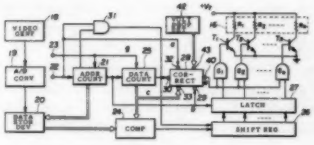
driving means supplied with said parallel n-bit data signal and said heating pulses for supplying to each of said n heating elements having a corresponding control datum with the logic value "1" a current having a predetermined magnitude for the widths of the heating pulses.

4,893,191

GRADATION CONTROL DEVICE FOR THERMAL INK-TRANSFER TYPE PRINTING APPARATUS

Hideshi Tanaka, and Kenichi Miyazaki, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Continuation-in-part of Ser. No. 96,659, Sep. 15, 1987. This application Mar. 28, 1988, Ser. No. 173,989
Claims priority, application Japan, Sep. 19, 1986, 61-22163; Mar. 31, 1987, 62-78979
Int. Cl.[4] H04N 1/40, 1/21, 1/23
U.S. Cl. 358—298 6 Claims



1. A gradation control device for a thermal ink-transfer type printing apparatus, said printing apparatus comprising a power source and a thermal printing head coupled to said power source through a transmission path and provided with n heating elements arranged in line, said n heating elements heating an ink film coated with a kind of ink which melts due to heat and transferring the melted ink onto a recording sheet which makes contact with the ink film to print images line by line, said gradation control device comprising:

memory means for storing at least n digital data of natural binary code which represent gradation levels with which a printing is to be carried out;

control data producing means including comparing means repeatedly supplied with the n digital data from said memory means in response to a clock pulse signal having a constant repetition frequency m times in a time period in which one line is printed and means for generating a reference printing density datum a value of which is changed every time the n digital data are supplied to said comparing means once, said comparing means being supplied with said reference printing density datum so as to compare the n digital data with said reference printing density datum, said control data producing means producing control data in a form of a serial n-bit data signal having a constant bit rate in accordance with said constant repetition frequency every time the n digital data are supplied to said comparing means once, each control datum constituting the serial n-bit data signal having a logic value "1" or "0" depending on whether or not each value of the n digital data is greater than or equal to the value of said reference printing datum;

serial-to-parallel converting means for converting said n-bit data signal into a parallel n-bit data signal;

voltage drop detecting means for detecting a voltage drop caused in a supply voltage to said thermal printing head and for producing a voltage drop datum dependent on the detected voltage drop;

heating pulse generating means for generating m heating pulses for printing on line, said m heating pulses respectively having pulse widths which are variable as a function of the value of the reference printing density datum and said voltage drop datum; and

driving means supplied with said parallel n-bit data signal and said heating pulses for supplying to each of said n heating elements having a corresponding control datum with the logic value "1" a current having a predetermined amplitude for current applying durations corresponding to the widths of the heating pulses,

said voltage drop detecting means detecting the voltage drop in a vicinity of an end of each of said current applying durations.

4,893,192

VIDEO SIGNAL DROP-OUT CORRECTOR CIRCUIT RESPONSIVE TO LEVEL OF LUMINANCE COMPONENT OF THE SIGNAL

Shinichi Takemura, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 169,254

Claims priority, application Japan, Mar. 17, 1987, 62-39443[U]

Int. Cl.[4] H04N *5/94*

U.S. Cl. 358—336 3 Claims

1. A drop-out corrector circuit for video signals comprising:

detecting means for detecting specific predetermined components of high-frequency signals including said video signals;

comparator means for comparing the output level of said detector means with a reference level and producing a drop-out detection pulse in response to the results of the comparison; and

means for varying said reference level according to the level of a luminance signal component of said video signals.

4,893,193

DISC RECORDING MEDIUM AND APPARATUS FOR PLAYBACK THEREOF

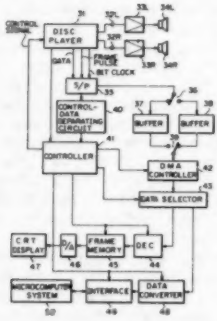
Shoichi Nakamura, and Tadao Suzaki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 163,132, Feb. 24, 1988, abandoned, which is a continuation of Ser. No. 763,132, Jul. 30, 1985, abandoned. This application Oct. 27, 1988, Ser. No. 266,207

Claims priority, application Japan, Nov. 30, 1983, 58-226598

Int. Cl.[4] H04N *5/92;* G11B *20/12, 27/10*

U.S. Cl. 358—341 12 Claims



1. A disc having a first recording region for storing a first type of data signal, a second recording region succeeding said first recording region for storing a second type of data signal, a lead-in region preceding said first recording region for storing an identifying data signal for indicating the presence of said second recording region, and a lead-out region between said first recording region and said second recording region for storing an end data signal for indicating the end of said first recording region.

4,893,194

MULTI-COPY SYSTEM FOR A DIGITAL COPIER

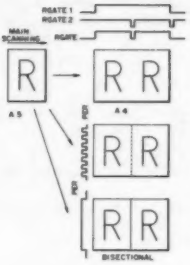
Seiji Sakata, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 191,328

Claims priority, application Japan, May 9, 1987, 62-113073

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—443 4 Claims



1. A multi-copy system for a digital copier, comprising:

store means for storing data which are provided by one main scanning;

data generating means for generating the data stored in said store means a plurality of times within a period of time of one scanning; and

discriminating means for discriminating a phantom line, a solid line and like borders between nearby data which are generated by said data generating means.

4,893,195

IMAGE PROCESSING APPARATUS CAPABLE OF ELIMINATING MOIRE PATTERN

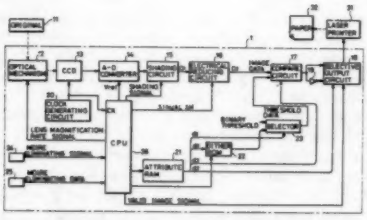
Kaoru Tada, and Masamichi Kishi, both of Azuchi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1988, Ser. No. 236,554

Claims priority, application Japan, Aug. 27, 1987, 62-213694; Sep. 26, 1987, 62-241697

Int. Cl.[4] H04N *1/40, 1/46*

U.S. Cl. 358—454 24 Claims



17. An image processing apparatus capable of eliminating a moire pattern, comprising:

an image sensor for converting an image of an original into electrical data;

optical projecting means for projecting the image of the original onto said image sensor and capable of changing a magnification rate of projection;

data reducing means for electrically reducing the electrical data converted by said image sensor at a reducing magnification rate corresponding to the magnification rate of projection of said optical projecting means;

area designating means for designating an area of a half tone image on the original;

moire pattern eliminating means for eliminating a moire pattern, generated when the image of the original is converted into electrical data by said image sensor, by controlling said optical projecting means such that it is operated at a prescribed magnification rate of projection;

data control means for invalidating the electrical data converted by said image sensor for areas other than the area designated by said area designating means;

magnification rate determining means for detecting the period of the generated moire pattern based on the electrical data not invalidated by said data control means and for determining said magnification rate of projection from said period of the moire pattern; and

moire pattern controlling means adapted to activate said moire pattern eliminating means using the magnification rate of projection determined by said magnification rate determining means to eliminate the moire pattern in said designated area.

4,893,196

IMAGE READING APPARATUS

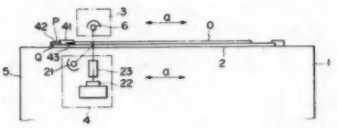
Takashi Koshiyouji, and Tsuyoshi Ishida, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 7, 1988, Ser. No. 178,615

Claims priority, application Japan, Apr. 9, 1987, 62-87488; May 19, 1987, 62-119993; Jul. 22, 1987, 62-182726

Int. Cl.[4] H04N *1/04, 1/10*

U.S. Cl. 358—474 **24 Claims**



15. An image reading apparatus for reading image data from an original comprising:

a transparent original table for supporting the original;

a first light source, located on one side of said original table, for irradiating light to the original supported on said original table;

a second light source located on the opposite side of said original table, for irradiating light to the original supported on said original table;

photoelectric converting means for receiving the light irradiated by said first light source and passing through the original and the light irradiated by said second light source and reflected from the original, for converting the light into a plurality of electric signals, and for outputting the electric signals as image data;

first drive means for moving said first light source and said photoelectric converting means simultaneously along said original table;

second drive means for moving said second light source and said photoelectric converting means simultaneously along said original table;

original-specifying means for specifying whether the original is one of a light-passing type and a light-reflecting type; and

control means for turning on said first light source, for keeping the second light source turned off, and for causing said first drive means to move said first light source and said photoelectric converting means simultaneously along said original table when the original is of the light-passing type and for turning on said second light source, for keeping the first light-source turned off, and for causing said second drive means to move said second light source and said photoelectric converting means simultaneously along said original table when the original is of the light-reflecting type.

4,893,197

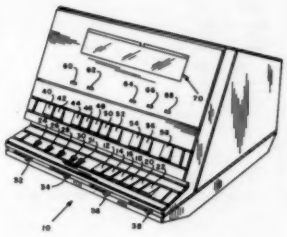
PAUSE COMPRESSION AND RECONSTITUTION FOR RECORDING/PLAYBACK APPARATUS

Joseph A. Howells, Brookfield, and Alan F. Sweet, Stratford, both of Conn., assignors to Dictaphone Corporation, Stratford, Conn.

Filed Dec. 29, 1988, Ser. No. 291,842

Int. Cl.[4] G11B *5/00, 5/02*

U.S. Cl. 360—8 **29 Claims**



1. Sound recording apparatus comprising: an input including analog-to-digital converter (ADC) means for receiving analog audio signals, converting the received audio signals to digitized audio signals and producing digital samples of the received audio signals; pause detecting means coupled to said input for detecting respective pauses in the received audio signals; pause encoding means for encoding the length of each detected pause and for producing a digital pause encoded signal representing said length; replacement means for replacing respective pauses in the digitized audio signals with the digital pause encoded signal therefor; digital recording means for recording the pause-replaced digitized audio signals; and temporary store means having addressable locations for storing said digital samples, and address generating means for generating addresses to identify the respective locations in which said digital samples are stored, whereby audio signals are recorded without original pauses and are compressed.

4,893,198

METHOD AND APPARATUS FOR PERFORMING HIGH SPEED VIDEO ANIMATION

Graeme M. Little, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 26, 1985, Ser. No. 727,455

Int. Cl.[4] G11B *27/02*

U.S. Cl. 360—14.1 **18 Claims**

1. System for recording an animated program as a succession of cels formed of a plurality of still images, comprising:

means for supplying the plurality of still images;

means for selecting the cel size in terms of the number of times a single still image is repeated for each cel;

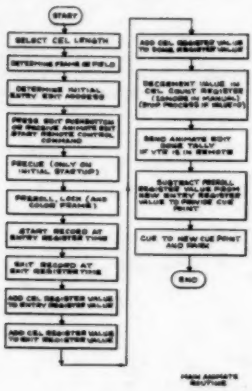
means for selecting a first edit entry point for a first selected cel;

means for continuously recording the entire first selected cell in response to the supplying means;

means for calculating the edit entry point of a succeeding cel by selectively adding the cel size to the first edit entry point;

means responsive to the calculating means for immediately recueing the recording means upon recording the first selected cel; and

wherein the recording means continuously records the succeeding cel at its respective edit entry point in response to



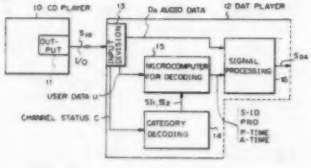
the supplying means providing a corresponding still image.

4,893,199

DIGITAL SIGNAL RECORDING APPARATUS WITH A DIGITAL SUBDATA CONVERTING CAPABILITY

Kentaro Okada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,505
Claims priority, application Japan, Sep. 16, 1987, 62-231785
Int. Cl.[4] G11B *5/09, 5/00*
U.S. Cl. 360—48 **3 Claims**



1. An apparatus for recording a transmitted digital signal formatted according to a predetermined digital interface format which includes main data, digital subcodes, such as a device category code, user data and channel status, wherein the recording apparatus is capable of recording digital main data and digital subcode data, including a category code specifying the recording apparatus' device type, according to a predetermined format, the recording apparatus comprising:

means supplied with the transmitted digital signal for detecting from the digital subcodes a category code indicating the type of device which transmitted the digital signal;

means supplied with the transmitted digital signal for converting the transmitted digital subcode data into corresponding subcode data formatted according to the format of the recording apparatus when the detected category code is different from its own category code;

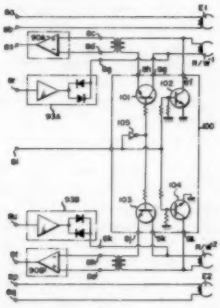
whereby the recording apparatus is enabled to record the received main digital data and the converted subcode data onto a recording medium.

4,893,200

COMPOSITE MAGNETIC HEAD

Yutaka Yunoki, Kunitachi; Manabu Inoue, Kokubunji, and Hiroyuki Wantanabe, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 270,386, Nov. 11, 1988. This application Apr. 25, 1989, Ser. No. 343,062
Claims priority, application Japan, Oct. 5, 1984, 59-209526; Oct. 24, 1984, 59-223617; Oct. 24, 1984, 59-223618; Oct. 24, 1984, 59-223619; Oct. 2, 1985, 60-219540
Int. Cl.[4] G11B *5/02*
U.S. Cl. 360—67 **3 Claims**



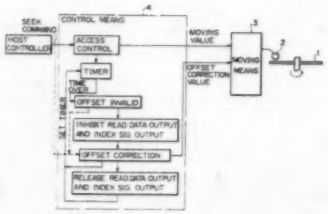
1. A composite magnetic head comprising a head chip mounted on a base, a read/write switch circuit for switching said head chip to a read or write system, a write amplifier for amplifying a write current and supplying the amplified current to said head ship when said head chip is connected to said write system by said read/write switch circuit, a step-up transformer, mounted on said base, for stepping up the level of a signal picked up by said head chip when said head chip is connected to said read system by said read/write switch circuit, and a differential input read amplifier for amplifying the signal stepped up by said step-up transformer, wherein said read/write switch circuit, said write amplifier, and said differential input amplifier are formed into a hybrid IC and mounted on said base.

4,893,201

TRACK ACCESS CONTROL SYSTEM FOR MAGNETIC DISK APPARATUS

Terunki Emori; Hiroyuki Mase, both of Kawasaki, and Ikuo Kitamura, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 6, 1988, Ser. No. 202,673
Claims priority, application Japan, Jun. 6, 1987, 62-140752
Int. Cl.[4] G11B *5/02, 5/596, 21/08*
U.S. Cl. 360—77.04 **10 Claims**



10. A method of accessing disk tracks including information, said method comprising:

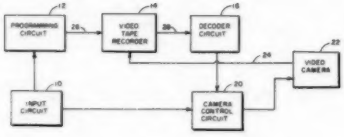
generating an offset correction value based on the information, said offset having a valid state and an invalid state;
measuring a predetermined time after which said offset correction value state is made invalid;
providing index and data signals responsive to the information during the predetermined time;
receiving a seek command;
determining if a seek command was received during the predetermined time;
inhibiting said index and data signals, initiating said generation of an offset correction value and restarting the measurement of the predetermined time if a seek command has not been received during the predetermined time.

4,893,202

VIDEO TAPE RECORDER CONTROL SYSTEM

William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Filed Mar. 16, 1988, Ser. No. 169,052
Int. Cl.[4] G11B *31/00*
U.S. Cl. 360—79 **18 Claims**



1. An automatic control system for a video camera, comprising:
an input circuit for generating control signals for operating at least one video camera;
a converter for converting said control signals to data signals suitable for recording on an audio track of a storage medium;
a recording and reproducing apparatus for recording and reproducing said data signals on said storage medium;
a decoder for decoding said reproduced data signals such that said recording/reproducing apparatus uses said data signals to directly control said at least one video camera;
wherein said recording and reproducing apparatus comprises a video tape recorder comprised of:
a recording and reproducing apparatus for recording said data signals and
for reproducing said data signals from said audio track while simultaneously recording a video signal from said at least one video camera on a video track of said video tape recorder.

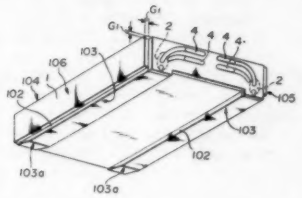
4,893,203

MAGNETIC HEAD

Joichiro Ezaki; Yoshiaki Itoh; Shunichi Katase, and Mikio Matsuzaki, all of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,426
Claims priority, application Japan, Aug. 14, 1987, 62-202892
Int. Cl.[4] G11B *5/60*
U.S. Cl. 360—103 **3 Claims**

1. A magnetic head which comprises a slider having a flying plane on its one surface opposed to a magnetic recording medium, a reading/writing element attached to the end surface at the air discharge side of said slider and a protective layer formed on said end surface so as to cover said reading/writing element, wherein an edge of said protective layer is inside an edge of said end surface at at least the upper surface which is opposite said flying plane, so that there is formed a space



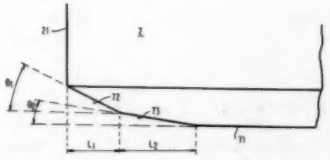
between the edge of said end surface and the edge of said protective layer.

4,893,204

AIR BEARING HEAD SLIDER HAVING FIRST AND SECOND LEADING EDGE TAPERED PORTIONS

Tadaharu Yamada; Makoto Watanabe, and Yoshihiro Terada, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,061
Claims priority, application Japan, Mar. 6, 1987, 62-52342
Int. Cl.[4] G11B *5/60*
U.S. Cl. 360—103 **13 Claims**



1. An air bearing head slider comprising: outside rails, each of said outside rails including a flat portion forming an air bearing surface which is to be opposed to a surface of a magnetic disk moving relative to said head slider; a first leading edge tapered portion formed on each of said outside rails at an air inflow edge on the upstream side of the relative movement of the magnetic disk to said head slider, said first leading edge tapered portion being inclined with respect to said flat portion by a first angle; and a second leading edge tapered portion formed on each of said outside rails between said flat portion and said first leading edge tapered portion, said second leading edge tapered portion being inclined with respect to said flat portion by a second angle which is smaller than said first angle; said first leading edge tapered portion of said outside rails being disposed in a first common plane and said second leading ledge tapered portions of said outside rails being disposed in a second common plane, the summed longitudinal length of said first and second leading edge tapered portions being between five and forty percent of the total longitudinal length of said head slider.

4,893,205

FLEXURE MOUNT FOR DISC DRIVES

Robert F. Hoppe, Santa Cruz; Terence H. West, Aptos, and Chun-Jer C. Cheng, Saratoga, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 18, 1988, Ser. No. 220,553
Int. Cl.[4] G11B *21/16*
U.S. Cl. 360—104 **6 Claims**

1. A flexure mounting arrangement for a disc drive system having a head positioner assembly for positioning a plurality of

transducer heads relative to a recording media located within a disc housing, the head positioner assembly having a plurality of platforms each arranged to carry at lest one flexure, each said flexure supporting one of said transducer heads, the flexure mounting arrangement comprising a plurality of flexure mounts having a longitudinal axis, each flexure mount including:

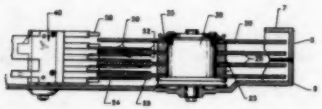
a base having a proximal protruding portion sized to mate with a recess in the mount's associated platform, the base being substantially perpendicular to said longitudinal axis;

a pair of attachment arms extending laterally from opposite sides of the base distally of said proximal protruding portion of the base, each attachment arm having a longitudinally extending screwhole that extends substantially parallel to the longitudinal axis of the mount, and a contact surface for engaging the mount's associated platform apart from said recess;

a flexure support pad extending distally from the base, the flexure support pad being thinner than the base and including flat support surfaces adapted to engage a selected one of said flexures;

means for coupling said selected flexure to said support pad; and

attachment means for coupling said flexure mount to said head positioner assembly through said screwholes.

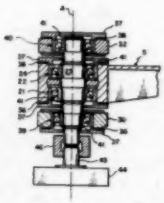


4,893,206

PIVOTING RADIAL ACCESS MECHANISM WITH SPINNING SUPPORT SHAFT

Boris A. Shtipelman, Rochester, and David L. White, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,425
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—106 **3 Claims**



1. Apparatus for controlling the radial position of a transducer relative to a spinning disk, said apparatus comprising a radial access arm for supporting such transducer; and means for mounting said arm for pivotal movement in a plane parallel to the disk plane, such movement serving to move the transducer along an arcuate path over the disk surface, said mounting means comprising:

(a) bearing means mounted on said arm at a location spaced from the transducer;

(b) a support shaft journalled for rotation in said bearing means;

(c) means for rotatably supporting said support shaft;

(d) drive means for continuously rotatably driving said support shaft in said shaft-supporting means to minimize rotational static friction between said shaft and said bearing means; and

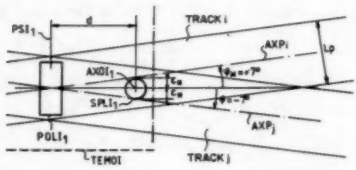
(e) means for controlling the pivotal position of said radial access arm about said continuously rotating support shaft independently of the rotation of said support shaft.

4,893,207

MAGNETIC WRITING AND OPTICAL READING HEAD FOR A DATA CARRIER

Christian Maury, Voisins le BX; Dan-Tam Pham, Bagneux, and Jean-Marie Richard, Houilles, all of France, assignors to Bull S.A., Paris, France

Filed Dec. 29, 1987, Ser. No. 138,863
Claims priority, application France, Dec. 30, 1986, 86 18321
Int. Cl.[4] G11B *5/127, 5/60*
U.S. Cl. 360—114 **12 Claims**



1. A magnetic writing and optical reading element adapted to fly above a magnetic data carrier, including at least two rails (PI_1, PI_2) and a groove disposed between them, and comprising at least

one optical device (SOI_1, SOI_2) disposed on one of the rails (PI_1, PI_2) for focusing a beam of light ($SPLI_1$) on the carrier adapted to be used for reading data written upon said carrier;

one magnetic writing transducer (TMI_1, TMI_2) disposed on the said one rail (PI_1, PI_2), the optical device and the magnetic transducer (TMI_1) having the same longitudinal axis, and

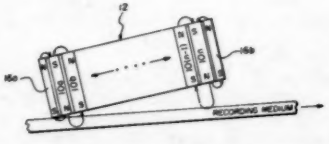
the optical device and the transducer are disposed in the immediate vicinity of one another, such that a distance d between an optical axis of the optical focusing device and a plane of symmetry (PSI_1) of a writing pole ($POLI_1$), perpendicular to the longitudinal axis, is less than a ratio of the difference between the width L_p of the tracks of said magnetic data carrier to be written upon by the transducer and the diameter D of the spot of light produced by the focusing optical element (SOI_1, SOI_2), said diameter D to be taken at a surface of said magnetic data carrier, to twice the sine of the maximum azimuth angle ψM.

4,893,208

MAGNETIC ERASE HEAD WITH TERMINATOR MAGNETS ON THE ENDS

Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1988, Ser. No. 191,950
Int. Cl.[4] G11B *5/325*
U.S. Cl. 360—118 **5 Claims**



1. In a magnetic erase head of the type having an array of an

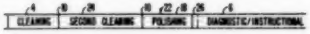
odd number of alternatingly polarized permanent erasing magnets of substantially equal thickness so disposed in the array thereof that their respective exiting fields are aimed generally at a recording medium that is to be erased, the improvement wherein the first and last magnets of the array are provided with terminator means for suppressing some of the respective fields which exit said first and last permanent magnets, said terminator means also being permanent magnets sandwiching therebetween said array of erasing magnets, said terminator means permanent magnets being about half as thick as the thickness of said permanent erasing magnets, said half-thickness permanent magnets being similarly polarized with respect to each other, and each being polarized oppositely with respect to its adjacent erasing magnet.

4,893,209

MULTIFUNCTIONAL MAGNETIC HEAD CLEANING MEDIA

Mohammed Siddiq, San Jose, Calif., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Apr. 18, 1988, Ser. No. 182,825
Int. Cl.[4] G11B *5/41*
U.S. Cl. 360—128 **9 Claims**



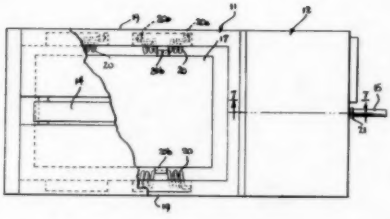
1. A multifunctional cleaning medium comprising:
a magnetic head cleaning segment;
a diagnostic/instructional segment containing diagnostic/instructional information for the user; and
means for masking the transition between the cleaning segment and the diagnostic/instructional segment, the masking means including a gap portion of the diagnostic/instructional segment, the gap portion having electronic noise recorded thereon.

4,893,210

COMPUTER DISK DRIVE ASSEMBLY HAVING A RESILIENTLY SUPPORTED SEPARABLE DISK PACK UNIT

Richard P. Mintzlaff, Granada Hills, Calif., assignor to Danford Corporation, San Pedro, Calif.

Filed Jul. 11, 1988, Ser. No. 217,618
Int. Cl.[4] G11B *17/00, 33/08;* G06F *1/00;* F16M *1/00*
U.S. Cl. 360—137 **2 Claims**



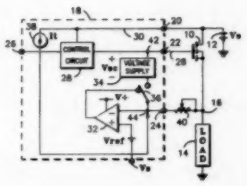
1. A computer disk drive assembly comprising:
a disk pack unit,
a power supply-wiring harness unit for providing power and wiring interconnections for said disk pack unit,
said disk pack unit including a housing having opposing walls, a disk drive, mounting means comprising wire coil springs attached to the walls of said housing and the disk drive for resiliently suspending said disk drive from the walls of said housing, said mounting means being adapted to provide vibration and shock isolation for said disk drive, connector means having contact pins for providing electrical connections to said disk pack unit, and an elongated channel formed in the bottom of said housing,
said power supply-wiring harness unit including an elongated plate member extending from the bottom thereof, said plate member fitting into the channel in the bottom of the disk pack unit housing in mating engagement therewith, connector means having contact pins for providing electrical connection from said power supply-wiring harness unit to said disk pack unit, and fastener means for mechanically interconnecting said power supply-wiring harness and said disk pack units in latching engagement with each other.
said fastener means operating on sequence first to mechanically join the units together with the connector means of said units joined together, then to bring the pins of the contact pins of said units into electrical contact with each other and finally to effect the connection of power from said power supply-wiring harness to unit to said disk pack unit.

4,893,211

METHOD AND CIRCUIT FOR PROVIDING ADJUSTABLE CONTROL OF SHORT CIRCUIT CURRENT THROUGH A SEMICONDUCTOR DEVICE

Byron G. Bynum, and Robert B. Jarrett, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1985, Ser. No. 718,416
Int. Cl.[4] H02H *9/02*
U.S. Cl. 361—18 **4 Claims**

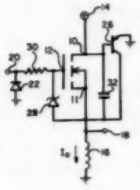


1. A method used in limiting the power dissipation in a transistor having a pair of electrodes defining a current path between a power source and a load, and a control electrode, comprising the steps of:
sensing the potential drop accurring between the pair of electrodes of the transistor; and
clamping the voltage potential between the control electrode and one of said pair of electrodes of the transistor to a predetermined value in response to said potential drop between said pair of electrodes exceeding a predetermined value to limit the current flow through the transistor to a reduced value wherein the step of clamping the voltage potential includes comparing the voltage level appearing at said one of said pair of electrodes of the transistor to a reference voltage level and establishing both a predetermined voltage potential and an adjustable voltage potential between said control electrode and said one of said pair of electrodes of the transistor whenever said voltage level appearing at said one of said pair of electrodes decreases below said reference voltage level.

4,893,212
PROTECTION OF POWER INTEGRATED CIRCUITS AGAINST LOAD VOLTAGE SURGES

Stephen L. Wong, Scarsdale, and Satyendranath Mukherjee, Yorktown Hts., both of N.Y., assignors to North American Philips Corp., New York, N.Y.

Filed Dec. 20, 1988, Ser. No. 288,062
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—91 **7 Claims**



1. A circuit arrangement comprising

a semiconductor switch having first and second switch terminals and a control terminal,

means for directly connecting said first switch terminal to one terminal of a power supply source whose other terminal is connected to a point of reference potential such as ground,

means for connecting said second switch terminal to one terminal of a two-terminal load device, the other terminal of said load device being connected to said point of reference potential,

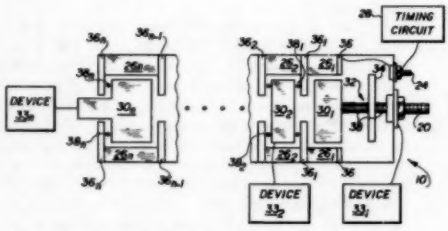
active means connected in parallel with said load device for providing an alternate current path for said load device only in response to the occurrence of a voltage surge across said load device, including a bipolar transistor having base, emitter and collector terminals, said emitter terminal being connected to said point of reference potential, said collector terminal being connected to said one terminal of said load device, and said base terminal being connected to said first switch terminal which is connected to said power supply source.

and means connected to said control terminal and to said second switch terminal for limiting the voltage that can appear between said control terminal and said second switch terminal when a load voltage surge occurs.

4,893,213
MULTI-STAGE SOLENOID WITH TIME DELAYED ACTUATION

John K. Apostolides, Pittsburgh, Pa., assignor to R.P.M. Industries, Washington, Pa.

Filed Jun. 17, 1988, Ser. No. 208,387
Int. Cl.[4] H01H 47/00
U.S. Cl. 361—191 **5 Claims**



1. A solenoid comprising:

the element closest to the second set of electrical contacts moves the flange of the plunger from its original position into contact with the second positive contact and second negative contact such that electricity flows therebetween via the flange; and

first biasing means in contact with the plunger such that when electricity stops being received by the coil winding closest to the second set of electrical contacts, the element closest to the second set of electrical contacts and the flange of the plunger in contact therewith are moved back to their original positions.

a housing having a first set of electrical contacts, and at least a second set of electrical contacts, said first set of electrical contacts having a first positive contact and a first negative contact extending from and penetrating into the housing, said second set of electrical contacts having a second positive contact and a second negative contact extending from and penetrating into the housing;

n coil windings disposed in the housing, where n is an integer and $n \geq 2$, said n coil windings being electrically distinct from each other;

a timing circuit electrically connected through the first set of electrical contacts and separately to each of the n coil windings for individually controlling when each of the n coil windings receives electricity;

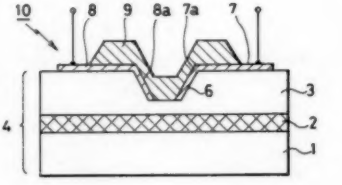
n magnetically responsive elements disposed in the housing at original positions and associated with the n coil windings such that each of the n coil windings is positioned with respect to its associated element so when electricity is received by the ith coil winding, the element the coil winding is positioned with respect to is caused to move, where i is an integer and $1 \leq i \leq n$;

a plunger having a flange made of electrically conducting material disposed in the housing and in contact with the element closest to the second set of electrical contacts such that when electricity is received by the coil winding associated with the element closest the second set of electrical contacts through the first set of electrical contacts from the timing circuit,

4,893,214
CAPACITANCE TYPE SENSITIVE ELEMENT AND A MANUFACTURING METHOD THEREOF

Satoru Nishiwaki, Tokyo; Yukinobu Takahashi; Kouji Murakami, both of Yokohama, and Norisuke Fukuda, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 9, 1988, Ser. No. 242,201
Claims priority, application Japan, Sep. 29, 1987, 62-242586
Int. Cl.[4] H01G 7/00, 5/20
U.S. Cl. 361—286 **9 Claims**



1. A capacitance type sensitive element comprising:

a pair of electrodes formed on an insulating substrate and having opposite electrode faces perpendicular or slantingly formed with respect to a face of the insulating substrate; and

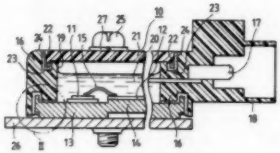
sensitive material disposed between the opposite electrode faces of the pair of electrodes and on both of the electrodes and having electrical characteristics changed on the basis of the physical or chemical interaction between the sensing means and a substance to be detected.

4,893,215

ELECTRONIC CIRCUIT APPARATUS OF AUTOMOBILE

Noriyoshi Urushiwara, Katsuta; Noboru Kobayashi, Mito, and Ryoichi Kobayashi, Naka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,507
Claims priority, application Japan, Sep. 30, 1987, 62-243819
Int. Cl.[4] H05K 7/14
U.S. Cl. 361—395 7 Claims



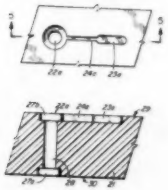
1. An electronic circuit apparatus of an automobile comprising a metal base which mounts electronic circuits; a mold resin case which is connected to a peripheral portion of the metal base, and forms a space together with the metal base enclosing the electronic circuits therein, said case including a molded connector which is used for inputting and outputting an electric signal from the electronic circuits; said molded resin case having a groove along all of the peripheral portion of a bottom surface thereof, said metal base forming a projection along all the peripheral portion of an edge thereof, and having a step portion next to the projection, and a bond material in the form of a silicon paste being filled in said groove of said bottom of said molded resin case and engaging said projection of said metal base, the bonding material covering a surface of said step portion of said metal base.

4,893,216

CIRCUIT BOARD AND METHOD OF SOLDERING

George R. Hagner, Cary, N.C., assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 9, 1988, Ser. No. 230,147
Int. Cl.[4] H05K 13/04, 3/34
U.S. Cl. 361—406 9 Claims



1. A pin grid array adapter (PGAA) comprising:
an electrically insulating substrate having first and second approximately parallel surfaces, at least said first surface provided with a plurality of grooves;
said grooves terminating at a first end in a pad area comprised of a widened groove, and terminating at a second end in a hole passing between said first and second surfaces;
electrically conductive pins in at least some of said holes, said pins protruding from said second surface;
an integrated circuit soldered to said first surface, with solder approximately filling said grooves, and solder sealing said holes having said pins.

9. A method of wave soldering a surface mounted component to a circuit board which has conductive grooves on a first surface and holes passing from said grooves to a second surface, said method comprising the steps of:
(a) positioning said surface mounted component on said first surface such that terminals of said component mate with respective grooves on said board;
(b) passing said circuit board through a wave of solder such that said wave of solder contacts said second surface of said circuit board and such that some solder from said wave engages at least some of said holes, moves through said holes and along at least some of said grooves to said terminals of said component; and
(c) removing said circuit board from said solder and allowing it to cool.

4,893,217

ALUMINUM ELECTROLYTE CAPACITOR

Wilhelm Schweikert, Heidenheim-Mergelst, and Wilhelm Lauer, Giengen-Huerben, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 276,367
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743629
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—506 7 Claims

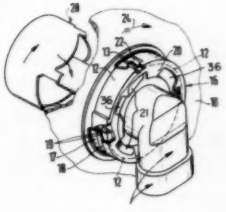
1. An aluminum electrolyte capacitor comprising two layers of aluminum foils would with one another, the anode foil thereof being provided with an oxide layer acting as dielectric, spacers that are saturated with a liquid operating electrolyte that contains combustible constituents are arranged between the foils, the aluminum electrolyte capacitor is integrated in a housing, and an absorbent mass that bonds electrolyte emerging from the winding is contained in the housing, the absorbent mass being pourable and only partially filling an empty volume of the housing.

4,893,218

HEADLIGHT FOR MOTOR VEHICLES, ESPECIALLY ROAD VEHICLES

Gerhard Dilk, Spiesen-Elversberg; Rolf Klaiber, Reutlingen; Kurt Kreschel, Bietigheim-Bissingen; Wolfgang Krieg, Reutlingen; Heinz Ruckwied, Kusterdingen-Wankheim, and Gerhard Ulrich, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,897
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719767
Int. Cl.[4] B60Q 1/00
U.S. Cl. 362—61 19 Claims



1. A headlight for motor vehicles, which comprises:
a reflector which has an outwardly protruding crown neck including an outer jacket;
a bulb base to which an incandescent bulb is secured and which is axially secured in said crown neck and centered radially thereon;
a ring that is detachably secured on said outer jacket of said

crown neck, thereby securing the incandescent bulb base on the reflector;

at least one unilaterally acting friction catch which detachably fastens said ring (16) on the outer jacket of the crown neck, said friction catch includes a body disposed on said outer jacket of said crown neck (11), and said ring (16) includes at least one pawl which engages said at least one friction catch; and

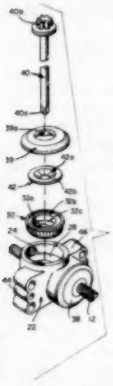
said body disposed on said outer jacket of said crown neck (11) comprises a plurality of radially spaced tightening faces (12) that extend radially outward circumferentially, and that said at least one pawl comprises a plurality of radially spaced inwardly directed protrusions (18).

4,893,219

HEADLAMP ADJUSTING MECHANISM

Stephen P. Lisak, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Sep. 30, 1988, Ser. No. 251,652
Int. Cl.[4] B60Q *1/06*
U.S. Cl. 362—66 **22 Claims**



1. An adjusting mechanism for a headlamp or the like comprising: a molded gear housing having a gear-journaling bore and an apertured cap portion having an interior surface closing one end of said bore; a drive gear rotatably journaled in said bore; a drive shaft extending through the aperture in said cap portion and having one end thereof operatively coupled with said gear within said bore; and a retainer member carrier entirely within said housing and engaging and securing said drive shaft within said bore and bearing against said cap portion in order to prevent retraction of said shaft end from said gear.

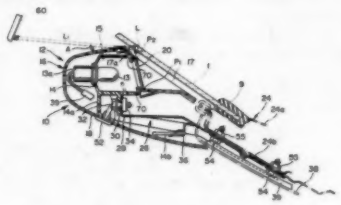
4,893,220

HIGH-MOUNTED STOPLIGHT FOR MOTOR VEHICLE

Susumu Kakidaira, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,171
Claims priority, application Japan, Dec. 28, 1987, 62-330005
Int. Cl.[4] B60Q *1/44*
U.S. Cl. 362—80.1 **2 Claims**

1. A high-mounted stoplight (10) for a motor vehicle, comprising: a lens (20) attached to an open front of a body (12) of said stoplight, a light source (13) provided in said body behind the lens; said lens and said open front of the body being located at the center of the width of said vehicle inside a rear window thereof and spaced from said window, and a shade (17) surrounding the lens, said shade having a top edge portion (17*a*) extending upwardly and inwardly in a direction substantially parallel to the rear window a sufficient distance to block light (L) emitted from said light source, transmitted from a foremost lower point (P_1; P_4) of said lens, past a foremost upper point (P_2; P_5) of the shade on a vertical central longitudinal section of said stoplight, and reflected by said window toward the



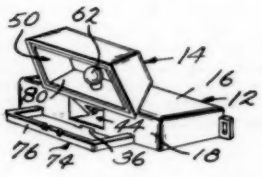
front of said vehicle, thus preventing such light from reaching a driver's eyes via a rearview mirror.

4,893,221

PORTABLE LIGHT

Arthur S. Friedman, Box 625, 2144 Seneca W., Merrick, N.Y. 11566

Filed Jul. 19, 1989, Ser. No. 381,985
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—108 **11 Claims**



1. A portable light comprising a battery case, a lamp housing, means mounting said lamp housing to said battery case for pivotal movement of the lamp housing between a closed position and an open position, means for forming an electrical circuit between said battery case and said lamp housing, said lamp housing defining a bulb compartment with an open face, said lamp housing projecting laterally from said battery case, a closure plate rigid with said battery case and projecting therefrom, said lamp housing, in the closed position, having the open face thereof engaged with and closed by said closure plate, and switch means for selectively opening and closing said circuit in response to pivotal movement of said lamp housing for closing said circuit in the open position of the lamp housing, and opening said circuit in the closed position of the lamp housing.

4,893,222

ILLUMINATION DEVICE FOR A HAND-HELD REMOTE CONTROL UNIT

Joseph H. Mintzer, 46 Ridge Rd., Hartsdale, N.Y. 10530

Filed Apr. 11, 1988, Ser. No. 179,744
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—109 **16 Claims**

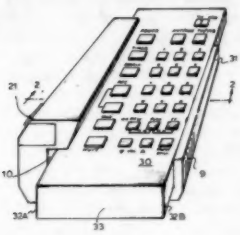
1. An illumination device for use with a hand-held remote control unit having a length, width and height and a front control panel, said illumination device comprising:

a base and a projection extending from and projecting above said base and being exposed to a space formed by said base;

said projection containing illumination means directed toward said space, said illumination means being capable of producing light rays;

said space being configured to accommodate receipt of at

least a portion of the length of said hand held remote control unit and the entire width and height thereof in said space so as to return the hand-held control unit in a position to subject a selected surface of said front control



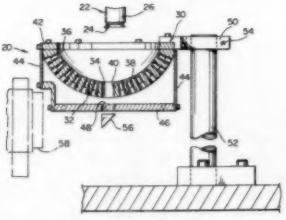
panel to said illumination means for facilitating illumination of said selected surface by reflecting light rays therefrom, while permitting actuation and operation of the hand-held remote control unit.

4,893,223

ILLUMINATION DEVICES FOR INSPECTION SYSTEMS

Aaron L. Arnold, Palm Beach Gardens, Fla., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 10, 1989, Ser. No. 295,277
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—252 **12 Claims**



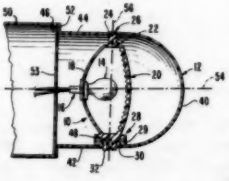
1. An illumination device for an inspection system comprising a mounting means for mounting a plurality of spaced apart light emitting diodes in mounting locations disposed in a part spherical array to cause light from the diodes to converge upon a particular restricted field of view, and a location means for locating an article to be illuminated in the restricted field of view.

4,893,224

EMERGENCY LIGHTING FIXTURE

Raymond K. Tinley, Mt. Prospect, Ill., assignor to Cooper Industries, Houston, Tex.

Filed Dec. 20, 1988, Ser. No. 286,821
Int. Cl.[4] F21V *21/28*
U.S. Cl. 362—287 **14 Claims**



1. An apparatus for adjusting the position of a light source comprising:

(a) a light source supporting structure;

(b) a housing; said support structure arranged for relative rotative movement within said housing;

(c) means for adjusting the position of said structure within said housing; said means including a rotatable member fixed to said structure and a fixed member fixed to said housing; said members being movable between a locked and unlocked position wherein in said locked position said members interengage to prohibit relative movement between said members and in said unlocked position said members can be rotated relative to each other; and

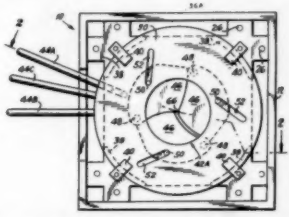
(d) said means for adjusting the position of said structure including a portion of said fixed member extending beyond said housing for operation by a user.

4,893,225

COLOR CHANGER

Dennis Solomon, Yormouth Port, Mass., assignor to Altman Stage Lighting Co., Inc., Yonkers, N.Y.

Continuation-in-part of Ser. No. 939,348, Dec. 8, 1986, Pat. No. 4,811,182. This application Mar. 3, 1988, Ser. No. 163,742
Int. Cl.[4] F21V *9/00*
U.S. Cl. 362—293 **15 Claims**



1. A color changer system mounted in a luminaire that contains at least one light source emitting a beam of white light and one lens, said beam having a cross-sectional axis and said luminaire having a beam emission and, comprising, in combination,

at least one support means mounted in said liminaire and having an aperture which passes said beam of white light,

iris means connected to said support means, said iris means being for coloring said beam of white light and being movable between an open position and a closed position including a plurality of intermediate positions between said open and closed positions, wherein in said open position the beam of white light passes said iris means uncolored by said iris means and in said closed position the beam is fully colored, and wherein in said plurality of intermediate positions said iris means during movement between said open and closed positions is successively positioned across portions of the beam extending from the periphery of the beam to positions spaced from the axis of the beam,

said iris means comprising at least one iris unit having a plurality of colored, translucent leaves centered about and disposes transverse to the beam axis, each of said leaves being positioned between said support means and said contol plate, and being rotatably mounted to said support means by a pivot member, each of said plurality of leaves being simultaneously rotatable about each said pivot member, such leaf of said plurality of leaves including an arced circumferential edge,

control means connected to said iris means and said at least one support means, said control means being for selectively positioning said iris means at any of selected open, closed, or intermediate positions,

said control means including a control plate supporting said at least one iris unit, said control plate forming another aperture aligned with said aperture of said support means, said control plate being rotatably connected to said support means, each of said plurality of leaves being slidably

connected to said plate for rotation of said leaves as said plate is rotated, and

mounting means connected to said circumferential edge of each of said plurality of translucent leaves, said mounting means supporting each of said plurality of translucent leaves, and said mounting means includes a plurality of arced mounting portions connected to said plurality of translucent leaves, each mounting portion of said plurality of mounting portions being thicker than said translucent portions, with each said mounting portion having an inner arched rim and an arced slot opening at said inner arced rim, and said translucent leaf being positioned in said arched slot.

4,893,226

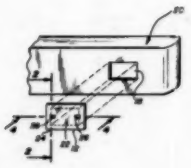
ADJUSTABLE LENS SHIELD ASSEMBLY FOR VEHICULAR LIGHTS

Roy M. Neece, 9436 Tranquil Acres Rd., Saginaw, Tex. 76179

Filed Jan. 23, 1989, Ser. No. 300,326

Int. Cl.[4] F21V *15/00*

U.S. Cl. 362—376 **25 Claims**



1. A lens shield assembly for protecting recessed automotive lights—such as the type mounted behind a cutout in a vehicle body—from impact with stones and other road debris which might be thrown into the air by a truck or the like, said assembly comprising:

(a) a protective plate having a peripheral region and an inner region, the plate being positionable against an outer vehicle surface to cover a cutout in the vehical surface behind which a light is recessed, and the inner region being esesntially transparent, the plate including at least a first opening which extends between a front and rear face of the plate and from the peripheral region toward the inner region.

(b) a first retaining member being manually positionable through the cutout in the vehicle surface to secure the plate to the vehicle surface;

(c) a clip attachable to the rear face cf the plate near the peripheral region thereof for sliding engagement along an edge portion of the first plate opening, said clip including a surface for contacting a portion of the vehicle surface bordering the cutout to secure said assembly to the vehicle surface; and

(d) a fastener positionable through the first plate opening to couple the plate to said clip, and said sliding engagement of the clip and securement of the assembly being effected by coupling said clip with the fastener.

4,893,227

PUSH PULL RESONANT FLYBACK SWITCHMODE POWER SUPPLY CONVERTER

George C. Gallios, Setauket; Charles Lien, Huntington; Remo Stella, Dix Hills, all of N.Y., and Wendell Boucher, Los Osos, Calif., assignors to Venus Scientific, Inc., Farmingdale, N.Y.

Filed Jul. 8, 1988, Ser. No. 216,548

Int. Cl.[4] H02M *3/335*

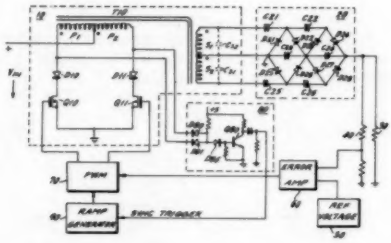
U.S. Cl. 363—26 **22 Claims**

1. A push pull resonant flyback switchmode power supply converter for supplying power to a load, comprising:

(a) a transformer having a primary and a secondary, said primary comprising first and second primary halves with an equal number of primary turns;

(b) first switch means for coupling an input voltage of an input power supply across said first primary half during a first series of time intervals to store energy from said input power supply in the form of current in the inductance of said primary without resonance and for disconnecting said first primary half from said input voltage during a second series of time intervals during which the current in the inductance of said primary is transferred to said secondary, said secondary having an inductance and a parallel stray capacitance, the energy stored in the form of voltage in said stray capacitance being transferred in the form of current to the inductance of said secondary by parallel resonance, the current in the inductance of said secondary being delivered to said load when the voltage across said stray capacitance resonates to a predetermined level which is greater than said input voltage;

(c) second switch means for coupling said input voltage of said input power supply across said second primary half during a third series of time intervals to store energy from



said input power supply in the form of current in the inductance of said primary without resonance and for disconnecting said second primary half from said input voltage during a fourth series of time intervals during which the current in the inductance of said primary is transferred to said secondary, the energy stored in the form of voltage in the stray capacitance of said secondary being transferred in the form of current to the inductance of said secondary by parallel resonance, the current in the inductance of said secondary being delivered to said load when the voltage across said stray capacitance resonates to said predetermined level which is greater than said input voltage;

(d) pulse width modulating means for controlling the switching of said first and second switch means to vary the length and frequency of said time intervals in response to variations in the load and in said input voltage; and

(e) means for synchronizing said pulse width modulating means to the frequency of said time intervals as required by the resonant frequency of the parallel stray capacitance and inductance of said secondary.

4,893,228

HIGH-EFFICIENCY PROGRAMMABLE POWER SUPPLY

Herbert P. Orrick, Rockaway, and Siu B. Wong, Randolph, both of N.J., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 91,630, Sep. 1, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,745

Int. Cl.[4] H02M *7/04*; G05F *1/56*

U.S. Cl. 363—89 **6 Claims**

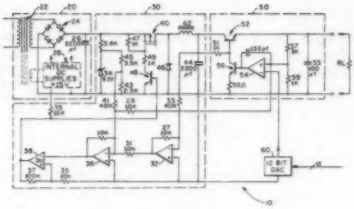
1. A power supply comprising:

a source of unregulated direct current;

an asynchronous switching pre-regulator receiving said

unregulated direct current and providing a pre-regulated direct current output;

a linear regulator receiving said pre-regulated direct current and including a series pass element therein, and selectively providing a regulated output according to an externally applied control signal, wherein



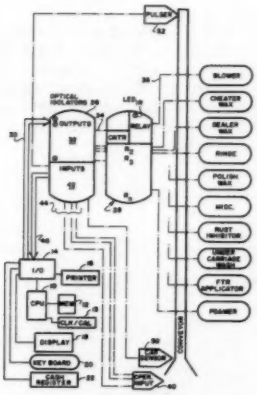
said switching pre-regulator includes means for measuring the voltage drop across the series pass element, and is responsive to the measured voltage drop across said series pass element, providing a selectable pre-regulated direct current potential which maintains a selected voltage drop across said series pass element independent of external periodic signals.

4,893,229

COMPUTERIZED CAR WASH CONTROLLER SYSTEM

Kevin Detrick, Stroudsburg, Pa., assignor to Innovative Control Systems, Inc., Allentown, Pa.

Filed Sep. 9, 1988, Ser. No. 242,725
Int. Cl.[4] G05B *19/00*; B08B *3/00*
U.S. Cl. 364—140 **20 Claims**



1. A computerized car wash having a plurality of washing and waxing devices for cars controllable by command signals, the computerized car wash comprising:

means for tracking positions of said cars as they move by said plurality of devices in said car wash;

an operator controlled input means for selecting select ones of said plurality of devices per car;

means for generating and applying said command signals to said plurality of devices based upon (1) said select ones identified by said input means, (2) a pre-established, base-line operational sequence for said plurality of devices and (3) said positions of said cars determined by said tracking means; and,

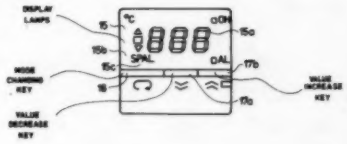
means for monitoring said tracking means and said input means and for determining the number of times and the duration when more than a single car has been tracked by said tracking means per selection by said input means.

4,893,230

PHYSICAL QUANTITY CONTROLLER

Tooru Shimomura, Muko; Kazutomo Naganawa, Suita; Toshiya Tanamura, Takatsuki, and Toshiaki Nagao, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 24, 1988, Ser. No. 172,438
Claims priority, application Japan, Sep. 30, 1987, 62-80341
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—146 **7 Claims**



1. A physical quantity controller, comprising:

a display means including a numeral display area for displaying a numeral thereon;

a numeral updating means for updating a numeral displayed on said numeral display area;

a mode changing means for changing display modes of said display means;

a storage means including (i) an input buffer for temporarily storing a numeral updated by said updating means, (ii) a counter for counting time elapsing after said numeral updating means has been actuated, and (iii) a storage area for storing a value relating to said physical quantity; and

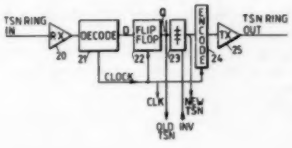
a writing means for writing said updated numeral stored in said input buffer into said storage area as a new value when said counter reaches a predetermined number after said numeral updating means has been actuated.

4,893,231

MULTI-NODE DATA PROCESSING SYSTEM

Donald Bell, Disley, United Kingdom, assignor to International Computers Limited, London, England

Filed Sep. 11, 1987, Ser. No. 95,113
Int. Cl.[4] C06F *15/00*
U.S. Cl. 364—200 **3 Claims**



1. Data processing apparatus comprising

(a) a plurality of data processing nodes,

(b) a plurality of data transmission links for carrying messages between the nodes, and

(c) allocation means common to all the nodes, for allocating a single global sequence of transmission sequence numbers to messages transmitted by the nodes, each message being allocated a transmission sequence number unique to that message,

(d) each node comprising means for reorganizing all of the

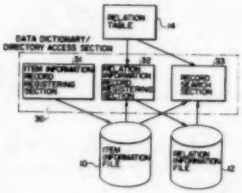
message received from all the transmission links into order of their transmission sequence numbers.

4,893,232

DATA MANAGEMENT SYSTEM FOR EFFICIENTLY SEARCHING DATA ELEMENTS AND HAVING A FLEXIBLE REGISTRATION ORDER OF DATA ELEMENTS

Kouichi Shimaoka, and Matoi Iizuka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 932,677, Nov. 20, 1986, abandoned. This application Aug. 19, 1988, Ser. No. 235,617
Claims priority, application Japan, Nov. 30, 1985, 60-269633
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **24 Claims**



1. A data management system for efficiently searching item information for a data element, comprising:

item information file means for storing a plurality of item information records, each showing a state of a data element belonging to an item, said item information file means being accessed by an item index using a part of a stored item information record;

relation table storing means for storing a relation table in which information indicating a relation between items is registered;

relation information file means for storing a plurality of relation information records, each showing relation information between source and object data elements, said relation information file means being accessed by a relation index using a part of a stored relation information record; and

search means, connected to said item information file means, said relation table storing means, and said relation information file means, for obtaining item information for a data element to be searched, by accessing said item information file means using the item index in order to obtain the item information for source and object data elements to be searched, by accessing said relation table storing means in order to obtain the information indicating the relation, and by accessing said relation information file means using the relation index in order to obtain the relation information, in accordance with an input search instruction.

4,893,233

METHOD AND APPARATUS FOR DYNAMICALLY CONTROLLING EACH STAGE OF A MULTI-STAGE PIPELINED DATA UNIT

Denman Marvin A., Austin, Tex., and Yoav Talgam, Tel-Aviv, Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1988, Ser. No. 182,630
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 **4 Claims**

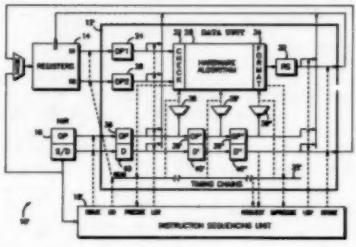
1. In a pipelined data unit for use in a data processor, a data unit comprising:

an input stage for selectively receiving input operands from said data processor;

a plurality of operation stages for performing selected operations on said input operands to produce an output result, at least a first one of said operation stages, coupled to said input stage, for performing its respective operation in one of a plurality of ways as selected by a value of a control signal;

an output stage, coupled to at least a last one of said operation stages, for selectively providing said output result to said data processor;

instruction buffer means, substantially coincident with said plurality of operation stages, for providing to each of said plurality of operation stages selected information related



to a respective one of a plurality of instructions executing in said plurality of operation stages; and

control means, coupled to said plurality of operation stages, for controlling execution of said instructions in each of said plurality of operation stages in accordance with the information relating thereto provided by said instruction buffer means;

the improvement comprising:

control signal buffer means, coupled to said instruction buffer means, for storing, for each of said instructions, a corresponding value of said control signal, and providing said corresponding value of said control signal to said first one of said operation stages substantially coincident with said instruction buffer means providing the corresponding instruction information.

4,893,234

MULTI-PROCESSOR INCLUDING DATA FLOW ACCELERATOR MODULE

George S. Davidson, and Paul E. Pierce, both of Albuquerque, N. Mex., assignors to United States Department of Energy, Washington, D.C.

Filed Jan. 15, 1987, Ser. No. 3,540
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **11 Claims**

1. A data flow computer for implementing a data flow graph, said computer including a plurality of processing means, each operable for executing a primitive computation of a node of the graph, and accelerator means for accelerating execution of said computation, said accelerator means comprising:

a plurality of memory cells for representing, respectively,

each of the nodes of the graph, each memory cell including:

a plurality of slot means for storing all the data operands required for a primitive computation; and

indicating means for providing a first output upon conclusion of each memory cycle for indicating that all operands required by a primitive associated with the cell are available, said indicating means comprising tag bit generating means for generating respective tag bits for each slot of said cell, each said tag bit having a first logic value for a particular slot each time one of said plurality of processing means writes data in said slot and for generating a tag bit of a second logic value for said slot each time one of said processing means reads data from said slot; and

identifying means for storing the address of only each memory cell with an indicating means providing a first output, said address being used by any one of said processing means to identify a respective primitive operation for operating on the data operands contained within said cell.

4,893,235

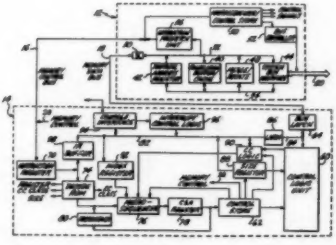
CENTRAL PROCESSING UNIT FOR A DIGITAL COMPUTER

H. Bruce Butts, Jr., Seattle; David N. Cutler, Mercer Island; Peter C. Schnorr, Redmond, and Robert T. Short, Woodinville, all of Wash., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 782,092, Sep. 30, 1985, abandoned, Division of Ser. No. 538,373, Oct. 3, 1983, Pat. No. 4,586,130. This application Jun. 16, 1988, Ser. No. 208,844

Int. Cl.[4] G06F *9/34*

U.S. Cl. 364—200 **5 Claims**



1. A central processing unit for a computer for decoding and executing macroinstructions comprising an operation code and first and second operand specifiers, wherein each operand specifier includes a register field and a mode field for specifying literal operands or direct or indirect addressing modes, each macroinstruction being executed by executing a series of microinstructions corresponding to said macroinstruction op-code, and including a micro op-code and first and second micro-operand specifiers having register and mode fields, said central processing unit comprising:

a plurality of general registers for the temporary storage of data representing operands or location of operands, each general register having a unique address associated therewith;

at least two pointer registers for the temporary storage of data, including data specifying the address of a general register and data representing the literal value of an operand, each pointer register having assigned to it (i) a direct address specifying as an operand the contents of the general register addressed in the register field of one of said micro-operand specifiers and (ii) a unique indirect address specifying as an operand address the contents of the general register addressed in the register field of said micro-operand;

decoding means for decoding the macroinstruction and for loading the register fields thereof, without alteration, into respective pointer registers; and

execution means for executing the macroinstruction by executing said corresponding series of microinstructions, the execution means including an ALU having first and second input ports, and register access means for providing data specified by a first pointer register to said first input port and for providing data specified by a second pointer register to said second input port.

4,893,236

ELECTRONIC CASH REGISTER

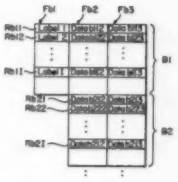
Souichi Ohnishi, Yao; Yasuhide Nakamura; Kensaku Komai, both of Yamatokoriyama, and Kazuyuki Goto, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 31, 1987, Ser. No. 80,568

Claims priority, application Japan, Jul. 31, 1986, 61-181705

Int. Cl.[4] G07G *1/12*

U.S. Cl. 364—405 **8 Claims**



7. An electronic cash register, comprising:

key input means having a plurality of operation keys;

file structured memory means divided into a plurality of file storage regions for storing a plurality of different types of accumulated data;

control means for controlling said key input means and said memory means;

wherein said control means controls said memory means so as to change the space allocation of a predetermined file storage region, generate a space allocation for a required file storage region or erase the space allocation for a selected file storage region in the memory means;

each of said file storage regions further including a file descriptor region and a file data region; and

wherein said file descriptor region for each file storage region stores start address, end address and data structure of said file data region for the respective file storage region.

4,893,237

INTERCONNECTED SALES DATA REGISTRATION AND PAYMENT SETTLEMENT SYSTEM

Shohei Unno, Numazu, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 27,808, Mar. 19, 1987, abandoned. This application May 31, 1989, Ser. No. 361,832

Claims priority, application Japan, Mar. 27, 1986, 61-69242

Int. Cl.[4] G07G *1/12*

U.S. Cl. 364—405 **8 Claims**

1. A sales data registration and payment settlement apparatus, comprising:

a plurality of register terminals each having a keyboard with a plurality of operation keys including a total key, first memory means, and first control means including:

means for writing, in said first memory means, sales data and total sales amount data for each customer;

means for generating the sales data and the total sales amount data upon operation of said operation keys;

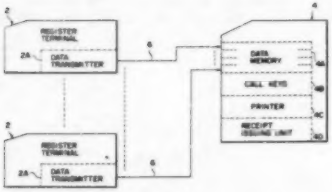
means for reading out the sales data and the total sales amount data from said first memory means; and

means for transmitting the read out sales data and total

sales amount data, upon operation of at least one operation key; and

an electronic cash register having input for receiving data output from said register terminals, a plurality of second memory means for storing sales data and total sales amount data received from said register terminals or each customer, a plurality of call keys each for designating a different one of said register terminals, printing means, and second control means including:

means responsive to operation of each of said call keys, for reading out, from a corresponding one of said plurality of second memory means, the sales data and the total sales amount data for one customer, received from one of said register terminals designated by one of said call keys; and



means for driving said printing means to print the read out data on a receipt;

wherein said first control means in each of said register terminals includes means for attaching a receipt number to said sales data and said total sales amount data for each customer, the receipt number being incremented each time said sales data and said total sales amount data are transmitted, and said reading out means of said second control means in said electronic cash register reads out from one of said second memory means the sales data and the total sales amount data for the customer having the earliest receipt number received from the register terminal designated by one of said call keys.

4,893,238

TEXT PROCESSING DEVICE FOR STENOGRAPHIC TYPING

Izaäk Venema, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1988, Ser. No. 157,448

Claims priority, application Netherlands, Feb. 19, 1987, 8700410

Int. Cl.[4] B41J *3/02*

U.S. Cl. 364—419 **16 Claims**

13. A method of entering an alphabetic text into a computer using abbreviated word forms and translating the abbreviated word forms into their corresponding complete word forms comprising:

for a majority of words, entering into the computer a sequence of alphabetic characters comprising less than all of the characters in said words, said sequence comprising an abbreviated word form including the first letter of each syllable of the corresponding complete word,

comparing each said abbreviated word form with a stored dictionary of corresponding abbreviated word forms and when a match is established,

translating said abbreviated word form into its corresponding complete word form by inserting one or more missing letters between each two successive letters of the abbreviated word form, and

storing, at least temporarily, in said computer the complete words corresponding to matched abbreviated words.

4,893,239

DEVICE FOR DETECTING DRIVING CONDITION FOR AUTOMOBILE

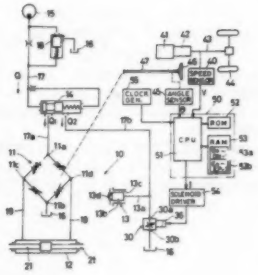
Kunihiko Eto, Toyota; Yutaka Mori, Okazaki; Shigeo Tanooka, and Kazumasa Kodama, both of Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 16, 1988, Ser. No. 156,012

Claims priority, application Japan, Feb. 16, 1987, 62-32927

Int. Cl.[4] B62D *5/06*

U.S. Cl. 364—424.05 **8 Claims**



1. An improved device for detecting driving conditions for an automobile including:

a speed sensor for detecting speed information which varies in response to the speed of said automobile;

index arithmetic means for effecting computation of a driving condition index corresponding to a driving condition encountered by an operator of said automobile wherein said driving condition index is calculated from changes in said speed information;

limit setting means for setting a limit value derived from said speed information, said limit value indicating a limit in the change rate of said driving condition index and varying depending upon the speed of said automobile;

compensating means for compensating said driving condition index by using said limit value so that the rate of change of said driving condition index over a predetermined time period is restricted to said limit value when said rate of change exceeds said limit value.

4,893,240

REMOTE CONTROL SYSTEM FOR OPERATING SELECTED FUNCTIONS OF A VEHICLE

Imad Karkouti, 8112A Trans Canada Highway, St-Laurent, Quebec H4S 1M5, Canada

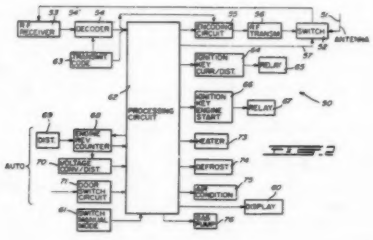
Continuation of Ser. No. 8,341, Jan. 29, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 320,793

Int. Cl.[4] F02N *11/08*

U.S. Cl. 364—424.05 **8 Claims**

1. A remote control system for operating selected functions in a vehicle operated by an engine, said system comprising a portable remote control unit, a vehicle operation unit associ-

ated with the electrical and mechanical systems of said vehicle, said remote control unit having a keyboard for programming a personal code therein and selecting a personal code and one or more function codes to be transmitted and executed by said vehicle operation unit, an encoder in said control unit to encode said personal code with one or more function codes prior to the transmission of an encoded signal by an RF transmitter contained in said control unit through a switching device, said operation unit having a receiver and a decoder for receiving and decoding said encoded signal and storing said personal code signal generated by said control unit and a code comparison program in a processing circuit for verifying said personal code and for performing command functions as determined by said one or more function codes, encoding circuit means for generating encoded signals corresponding to said received personal code and said selected one or more function codes to indicate that said operation unit is operational or not, a transmitter for transmitting said encoded signals, said decoder also verifying said personal code and said selected one or more function codes, said processing circuit is further provided in said vehicle operation unit for processing said selected one or more function codes and operating an interface circuit corresponding to said function code, said vehicle operation unit also having a coding and transmitting circuit for transmitting to said control unit a confirmation signal to confirm that said personal code has been matched and that it is ready to receive one or more function code signals by said control unit, said control unit being provided with a receiver circuit and a decoder for receiving said confirmation signal and an operational signal indicative of the operation of the selected one or more function codes and verifying if said operation unit has accepted said personal code and effected said one or more function codes, display means on said control unit to display the acceptance of said confirmation signal and selected one or more function codes by said operation unit, said remote control unit and said vehicle operation unit each being provided with an output switching circuit which is automatically placed in a transmit or receive mode by its respective unit, one of said selected function codes being an engine starting function code for starting said engine, said starting function code generating a starting function signal which operates two interface circuits, a first of said two interface circuits being operated to distribute current to selected electrical equipment to be operated in the vehicle, and a second interface circuit being operated for starting said engine, each said first and second interface circuits being associated with a relay coil for the operation thereof, a third interface circuit for detecting the operation of said engine of said vehicle, said third interface circuit sensing the frequency of a distributor associated with said engine, said third interface circuit being connected to said processing circuit of said vehicle operation unit and effecting the transmission of a function operation signal upon detection of said frequency to indicate to said control unit that said engine is properly operating, said processing circuit automatically monitors said engine by detection of the revolutions of said distributor provided by a revolution counter.

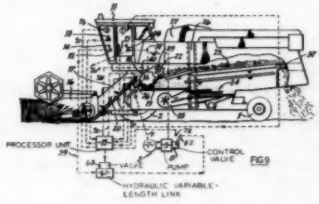


4,893,241

CROP PROCESSING APPARATUS

Joseph C. Girodat, West Milton; David W. Rumble, King City; Lawrence M. Sweetman, Mississauga, and William Swindall, Ayr, all of Ontario, Canada, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 10, 1987, Ser. No. 36,952
Int. Cl.[4] A01D *41/00*; G06F *15/20*
U.S. Cl. 364—424.07 27 Claims



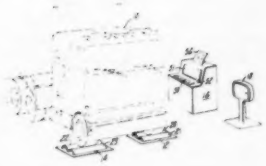
1. Crop processing apparatus comprising crop processing means; drive means comprising an input drive shaft, an output driven shaft connected to drive the crop processing means, and transmission means through which power is transmitted from the input drive shaft to the output driven shaft and in which relative rotation between the input drive shaft and output driven shaft under constant load conditions causes a transmission loss; a first sensor for producing an output signal corresponding to the rate of rotation of the output driven shaft; setting means for selecting a reference signal corresponding to a selected level of transmission loss in the transmission means; signal processing means which processes the output signal from the first sensor to produce a transmission loss signal corresponding to said transmission loss in the transmission means and which compares said transmission loss signal with said reference signal to produce a crop load control signal; and actuator means that is controlled in accordance with said crop load control signal and is effective to vary the rate of feed of crop to the crop processing means to maintain a substantially uniform load of crop in the crop processing means.

4,893,242

VEHICLE BRAKE TEST SYSTEM

John N. Rogers; James M. Lady; Donald W. Bilsbarrow, and Rene S. Trujillo, all of Tucson, Ariz., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1987, Ser. No. 137,686
Int. Cl.[4] G01L *5/28*; G06F *15/20*
U.S. Cl. 364—426.01 2 Claims



1. The method of testing the braking force of an axle of a vehicle, comprising the steps of:

positioning the axle's left side and right side wheels on left and right brake test apparatus of the type having rollers driven at constant speed by a variable magnitude torque signal;

actuating the vehicle's braking system with increasingly increasing applied force over a real time test interval;

sampling in pairs, periodically over the test interval, the

magnitude of the left (BK_1) and right (BK_1) torque signals applied in near coincidence to the left and right brake test apparatus, and storing the sampled pair of coincident torque signal magnitudes;

filtering the left and right side values of each sampled pair of coincident torque signal magnitudes (i), from i=1 to Q, using the following algorithm

$$BK_i ave = \frac{\sum_{n=i-K/2}^{n=i+K/2} BK_n}{K}$$

Where:

BK_i ave=The summation value of BK_n

K=The number of sampled pairs of coincident torque signal magnitudes per tire revolution

to produce filtered pairs of coincident torque signal magnitudes;

reporting, as a maximum brake force value for the axle, the maximum one of the left and right side sum values of said filtered pairs of coincident torque signal magnitudes; and

indicating, as the axle brake force imbalance, the maximum one of the left and right difference values of said filtered pairs of coincident torque signal magnitudes.

4,893,243

CONTROL DEVICE FOR MAINTAINING CONSTANT SPEED OF AN AUTOMOBILE

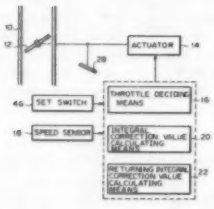
Tetsuya Tada, Anjyo; Hiroaki Tabuchi, Toyota, and Tatsuo Teratani, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 27, 1988, Ser. No. 149,074

Claims priority, application Japan, Jan. 28, 1987, 62-015925

Int. Cl.[4] B60K *31/00*

U.S. Cl. 364—426.04 **13 Claims**



1. A control device for maintaining a constant speed of an automobile, said automobile having an internal combustion engine with an intake air passage and a throttle valve arranged therein, said control device comprising:

an actuator connected to said throttle valve;

means for setting a desired set speed of the automobile;

means for detecting a speed of the automobile;

throttle deciding means for determining an initial degree of opening of said throttle valve, and controlling said actuator in correspondence with a desired degree of opening of said throttle valve, to bring the speed of the automobile to approach said set speed;

a first calculating means for determining a difference between the detected speed and the set speed and cyclically obtaining an integral at a predetermined first gain when said difference is a predetermined amount, and calculating an integral correction value and correcting said desired degree of opening of said throttle valve based on said integral correction value when said difference exists; and

a second calculating means for adjusting said integral correction value toward its initial value at a predetermined second gain greater than said predetermined first gain when said integral correction value calculated by said first calculating means becomes greater than a second predetermined value and the difference between the detected speed and said set speed is no longer the predetermined amount.

4,893,244

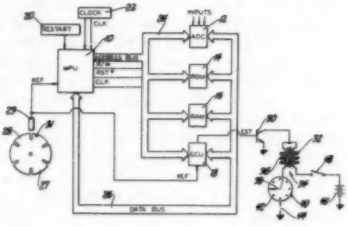
PREDICTIVE SPARK TIMING METHOD

Dah-Lain Tang, Canton; Man-Feng Chang, and Myrna C. Sultan, both of Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1988, Ser. No. 237,021

Int. Cl.[4] F02P *5/15*

U.S. Cl. 364—431.03 **7 Claims**



1. A method of determining spark time in a spark timing system of an internal combustion engine having a plurality of cylinders and a spark period for each cylinder in which a spark occurs, comprising the steps of:

generating at least one crankshaft position reference pulse for each spark firing event, the reference pulse nearest the next spark being set to occur within a same cylinder event as the next spark;

measuring at least two reference periods between recent reference pulses;

calculating the spark timing synchronously with crankshaft position by performing the calculation upon receipt of the reference pulse nearest the next spark;

predicting the engine speed for the next spark period from at least two reference periods including the most recent reference period; and

based on the predicted speed, calculating a spark time measured from the said reference pulse nearest the next spark.

4,893,245

WINDSHEAR GUIDANCE FOR AIRCRAFT HAVING INERTIAL SENSOR

Terry L. Zweifel, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 11, 1988, Ser. No. 141,752

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—435 **10 Claims**

1. An aircraft flight path angle control system including an inertial reference system, comprising:

means responsive to said inertial reference system for sensing an inertial flight path angle for the aircraft and producing a signal representative thereof;

means for providing a signal representative of a predetermined flight angle,

means responsive to said signals representative of an inertial flight path angle and a predetermined flight path angle for producing an algebraic difference thereof,

means responsive to said difference for deriving an error signal,

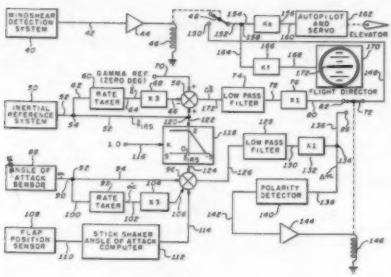
means for applying said error signal to said control system,

means for providing a signal representative of stick shaker angle of attack,

means for sensing the actual angle of attack of the aircraft and providing a signal representative thereof,

means responsive to said signals representative of stick shaker angle of attack and actual angle of attack for forming an algebraic difference thereof,

means for combining said error signal with said difference of



stick shaker angle of attack and actual angle of attack to form a further difference thereof corresponding to a maximum safe angle of attack, and

means for varying said error signal in accordance with a predetermined value of inertial angle of attack.

4,893,246

APPARATUS FOR DISPLAYING TRAVEL PATH

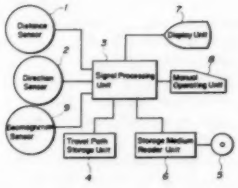
Akira Iihoshi; Yukinobu Nakamura, and Shinichiro Yasui, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,680

Claims priority, application Japan, Dec. 15, 1986, 61-298353

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—449 **4 Claims**



2. An apparatus for displaying a travel path of a moving body during travel on two-dimensional coordinates is successively computed and the current location is displayed on a map and successively renewed according to data of the current location thus computed, comprising:

means for setting at least one target point on a desired running course on the map;

means for setting a running direction of the moving body at the target point; and

means for deciding that the moving body has passed the target point by a first determination that a closest distance of the current location of the moving body relative to the target point, the closest distance having been obtained by computation of data of position of the target point and data of the current location, is within a predetermined distance and by a second determination that a difference in angle between an actual running direction of the moving body after reaching a closest position relative to the target point and a running direction previously set at the target point is within a predetermined angle.

4,893,247

ORIENTATION AND LOCALIZATION TABLE ON MAP

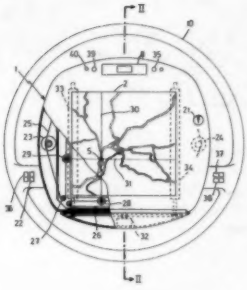
Claude Waudoit, rue du Goddiarch 1, 6320 Villers-la-Ville, Belgium

Continuation-in-part of Ser. No. 34,346, Mar. 30, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,942

Claims priority, application Belgium, Mar. 28, 1986, 904513

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—449 **4 Claims**



1. A map position orientation and location apparatus employing inexpensive and commercially available DC motors with a calculator, said apparatus indicating the position of a carrier such as a vehicle, on a map, comprising a map support adapted to be movably supported on a steering wheel, an electrical orientation DC motor for moving said map support with respect to said steering wheel, a localization device including a mobile reference mounted on said map support so that the mobile reference will move automatically above the map placed on the map support, said mobile reference being provided with a light source supported by the wires actuated by a pair of DC motors, roller means for supporting said map over said map support, a steering wheel position sensor connected to said calculator and providing a signal proportional to the steering mechanism of the vehicle, a vehicle displacement indicator including a displacement sensor connected to said calculator, a vehicle orientation indicator connected to said calculator, whereby said calculator monitors the mechanisms of the orientation of the map support and displacement of the mobile reference in response to electrical signals continuously provided by said vehicle displacement indicator, the vehicle orientation indicator, and the steering wheel position sensor.

4,893,248

MONITORING AND REPORTING SYSTEM FOR REMOTE TERMINALS

W. Hampton Pitts, and Ronald G. Thomas, both of Nashville, Tenn., assignors to Access Corporation, Nashville, Tenn.

Filed Feb. 6, 1987, Ser. No. 11,976

Int. Cl.[4] H04H *9/00*; G06F *15/20*

U.S. Cl. 364—464.01 **62 Claims**

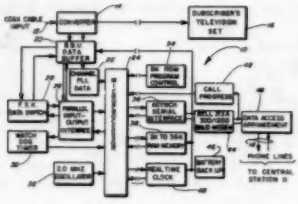
1. A remote terminal for use in a system for monitoring and accumulating data indicative of viewer authorized pay per view programs on a television set at each of a plurality of remote terminals, each of said remote terminals connected by non-dedicated telephone lines for transmitting said accumulated data over said telephone lines to a host computer at a central station, said host computer processing said transmitted data to provide bills to said viewers, each of said remote terminals comprising:

(a) means actuated by a viewer for authorizing the viewing of a pay per view program upon the television set;

(b) means connected to said authorizing means and responsive to the viewer actuation of said authorizing means for

monitoring the viewing of said pay per view program to provide program data indicative thereof;

(c) memory means connected to said monitoring means for storing said program data therefrom; and



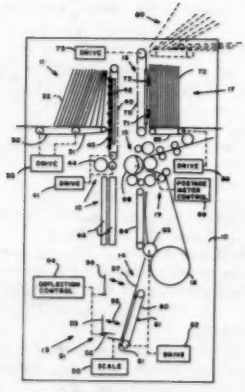
(d) means connected to said authorizing means and said memory means, and responsive to said authorization for transmitting over said telephone lines to said host computer a report message including said program data.

4,893,249

MAILING MACHINE

Morton Silverberg, Westport, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 17, 1987, Ser. No. 134,492
Int. Cl.[4] B65G *17/26*
U.S. Cl. 364—464.03 **25 Claims**



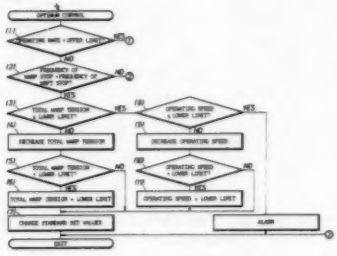
1. In a plural object processing system having a processing station, an input station, a first transporting means for sequentially feeding objects from said input station to said processing station, an output station, and a second transporting means for sequentially directing objects from said processing station to said output station; the improvement wherein said first and second transporting means are arranged to transport said objects respectively in first and second substantiallY opposite directions.

4,893,250

CENTRALIZED LOOM CONTROL METHOD WITH OPTIMIZATION OF OPERATING SPEED

Tsutomu Sainen, Kanazawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Mar. 28, 1989, Ser. No. 329,638
Claims priority, application Japan, Mar. 28, 1988, 63-073639
Int. Cl.[4] G06F *15/46*; D03D *51/00*
U.S. Cl. 364—470 **3 Claims**



1. A centralized loom control method to be carried out by a centralized loom control system comprising a host computer, memory means connected to the host computer, and a plurality of loom control units which are controlled by control signals given thereto from the host computer; comprising steps of:

storing a data base including data accumulated by recording past actual weaving conditions in the memory means;

entering data representing the specifications of a fabric to be woven in the host computer;

deciding whether or not standard set values for a fabric of the same specifications as these of the fabric to be woven are stored in the memory means;

reading the standard set values from the memory means when the standard set values for the fabric to be woven is stored in the memory means or reading standard set values for fabrics of specifications approximately similar to those of the fabric to be woven from the memory means;

determining standard set values for the fabric to be woven by processing the standard set values for fabrics of specifications approximately similar to those of the fabric to be woven through predetermined calculation or interpolation;

comparing a standard operating speed among the standard set values with a target operating speed of a loom on which the fabric is to be woven and changing the standard set values according to the result of comparison for a new standard set values suitable for weaving operation at the target operating speed; and

giving a control signal to the loom control units to operate the looms controlled respectively by the loom control units at the new standard operating speed.

4,893,251

METHOD OF GENERATING CUTTING PATH OF COMPLEX CURVED SURFACE

Masaki Seki, and Koji Samukawa, both of Tokyo, Japan, assignors to Fanuc Ltd., Tokyo, Japan

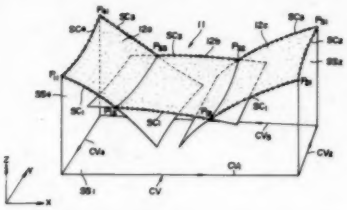
PCT No. PCT/JP87/00477, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO88/00367, PCT Pub. Date Jan. 4, 1988
PCT Filed Jul. 7, 1987, Ser. No. 171,870
Claims priority, application Japan, Jul. 9, 1986, 61-161518
Int. Cl.[4] G05B *19/403*
U.S. Cl. 364—474.29 **5 Claims**

1. A method of generating a cutting path for a complex

curved surface having at least two three-dimensional curved surfaces, said method comprising the steps of:

inputting data corresponding to each of the three-dimensional curved surfaces, and specifying one curve in a predetermined plane, said specified curve comprising two or more elements, each element comprising one of a line segment and a circular arc;

finding section curves of the complex curved surface by



dividing the complex curved surface into sections defined by planes, each of the planes corresponding to one of the elements of said specified curve in said predetermined plane that are i-th (i=1, 2, . . .) elements in a predetermined direction among the number of elements constituting said specified curve; and

generating as a cutting path, a path for moving a tool along said section curves corresponding to the elements in said predetermined order of the elements.

4,893,252

MONITORING SYSTEM FOR THE OUTPUT STAGE OF A BRIDGE

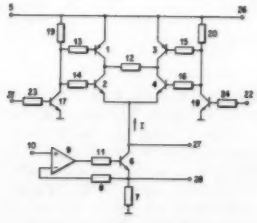
Thomas Blümel, Schmitten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,116

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643869

Int. Cl.[4] G01R *19/10*; G05F *1/56*

U.S. Cl. 364—483 **11 Claims**



1. A monitoring system for an electric power source capable of supplying current to a load, wherein the power source is to be energized by a source of operating voltage, the power source having a controllable source of current and a bridge output stage, which stage is connected in series with the controllable source of current between terminals of the source of operating voltage, the system comprising:

a subtraction circuit;

a computer with an analog-to-digital converter;

a current-measuring resistor connected in series with the bridge output stage; and wherein

a voltage drop across the bridge output stage and a voltage drop across the current-measuring resistor are applied to separate input terminals of the subtraction circuit, the subtraction circuit is connected via the analog-to-digital converter to an input of the computer, the computer being operated with a program for testing whether a voltage at the input of the computer lies within a predetermined range.

4,893,253

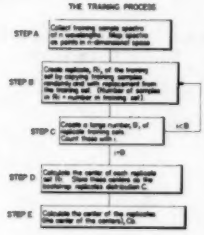
METHOD FOR ANALYZING INTACT CAPSULES AND TABLETS BY NEAR-INFRARED REFLECTANCE SPECTROMETRY

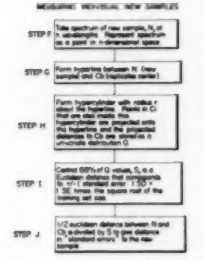
Robert A. Lodder, Bloomington, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Mar. 10, 1988, Ser. No. 166,233

Int. Cl.[4] G06F *15/20, 15/42*

U.S. Cl. 364—497 **3 Claims**





1. An analytical method for detecting adulterants in samples using a Near Infrared Reflectance Analysis (NIRS) instrument comprising the steps of:

(a) obtaining spectra at an appropriate number of wavelengths for a training set of an appropriate number of unadulterated samples;

(b) performing a transformation of each spectrum by representing such spectrum as a single point in hyperspace, and thus yielding a cluster of points in n-dimensional hyperspace, where n is the number of wavelengths utilized;

(c) creating a large set of training set sample replicates, each replicate being the same size as the training set, by randomly selecting samples from the training set, with replacement from the training set, and thus creating a bootstrap replicate distribution;

(d) calculating the center of the bootstrap replicate distribution;

(e) obtaining a spectrum for an adulterated sample;

(f) transforming this spectrum into a point in hyperspace;

(g) forming a hyperline in hyperspace between the point in hyperspace yielded from the spectrum of the adulterated sample and the center point of the bootstrap replicate distribution;

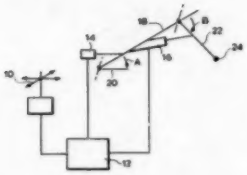
(h) forming a hypercylinder around the hyperline containing points of the training set sample replicates;
(i) projecting the multivariate points of the training set sample replicates onto the hyperline to form a univariate distribution of points;
(j) using this univariate distribution of points to construct confidence limits;
(k) identifying as abnormal the adulterated sample, the point of which falls three central 68% quantiles outside of the cluster of points yielded by the replicate spectra obtained from the training set sample replicates of the training set.

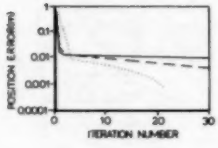
4,893,254

MANIPULATOR ARM POSITION SENSING

STephen K. C. Chan, and Peter D. Lawrence, both of Vancouver, Canada, assignors to University of British Columbia, Vancouver, Canada

Filed Apr. 20, 1988, Ser. No. 184,107
Int. Cl.[4] G05B *19/18*
U.S. Cl. 364—513 **7 Claims**





1. A method of controlling the movement of an articulated arm comprising applying command to a control computer to define a target position for an end point of said articulated arm, applying an iterative pseudoinverse Jacobian having a damping factor for defining the amount of change of each joint angle for each joint to be actuated of said arm, changing the magnitude of said damping factor for each iteration in accordance with the calculated workspace distance between the end point and the target position so that said damping factor increases with an increase in said distance, adjusting the angles of said joints of said arms in accordance with angles determined using a number of iterations in the range of 1 to 20.

4,893,255

SPIKE TRANSMISSION FOR NEURAL NETWORKS

Max S. Tomlinson, Jr., San Diego, Calif., assignor to Analog Intelligence Corp., Carlsbad, Calif.

Filed May 31, 1988, Ser. No. 200,604
Int. Cl.[4] G06F *15/18*; G06G *7/12*
U.S. Cl. 364—513 **21 Claims**

1. A neural network for receiving an input vector comprised of input vector elements, each representing an input vector element value, and, in response thereto and as a function thereof, for outputing a network output value; said network comprising:

a plurality of matrix elements, corresponding in number to the number of elements in the input vector, each comprising:

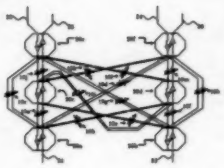
means for receiving a corresponding element of the input vector as an input data value;

duty cycle conversion means

for receiving said input data value, and

for producing an output data signal, said output data signal being a pulse train whose duty cycle is proportional to said input data value;

and



means for transmitting said output data signal; and

a combining element, comprising:

means for OR'ing said output data signals from said matrix elements to produce a raw squashed data output signal; and

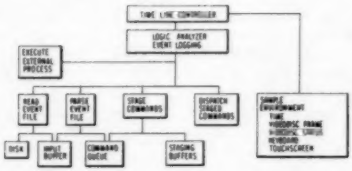
means for transmitting said raw squashed data output signal as said network output value.

4,893,256

INTERACTIVE VIDEO COMPOSITION AND PRESENTATION SYSTEMS

Charles T. Rutherfoord, DeKalb, and Nancy S. Frank, Fulton, both of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1986, Ser. No. 848,171
Int. Cl.[4] G06F *13/10*
U.S. Cl. 364—518 **14 Claims**



1. An interactive software multi-media presentation composing method for a computer system, said computer system comprising a display monitor and an operator input device, said computer system controlling a plurality of input and output multi-media devices, said software method assisting an operator of the computer system in developing an interactive multi-media presentation for use by a user, said interactive multi-media presentation comprising a plurality of events executed by the computer system and the input and output multi-media devices under the control of said computer system and in response to inputs by said user, said software method comprising the steps of:

providing to the operator on the display monitor for each event in a presentation list of events a set of event elements which may take place during the event and a set of time periods for the event elements, each event element in the list corresponding to an input or output multi-media device controlled by said computer;

said set of event elements and said set of time elements defining a matrix whereby each cell of the matrix represents the operation of one of said multi-media devices during one time period of a plurality of time periods of an event;

prompting the operator to select one or more event elements

from the list and to specify a time period for each event element selected;

prompting the operator, for each event, to specify a next event, said next event including a branch event dependent on a user input during said interactive presentation; and

generating and storing a representation of each event and the sequence in which events are to be executed by the computer system and the devices under its control, all in response to signals from the operator input device.

4,893,257

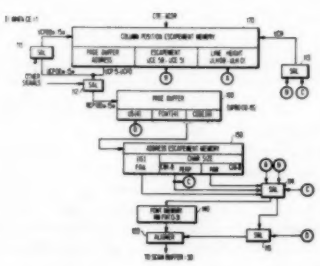
MULTIDIRECTIONAL SCAN AND PRINT CAPABILITY

Ruben Dominguez, Jr.; David E. Finlay; Stephen D. Hanna, all of Boulder; Jesus C. Lopez; David C. Stevenson, both of Longmont, all of Colo., and Donald W. Zegafuse, Jr., deceased, Nicholasville, Ky. (by Mary A. Zegafuse Smith, executrix), assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1986, Ser. No. 929,030

Int. Cl.[4] G06F *3/09*

U.S. Cl. 364—519 **19 Claims**



1. An apparatus for generating symbols to be imaged on an output device in successive rows of symbols, scanned in a raster fashion along successive scan lines in which said scan lines can be parallel to said rows of symbols and directed left to right, successive scan lines progressing from top to bottom or vice versa, or said scan lines can be perpendicular to said rows of symbols and directed top to bottom, successive scan lines progressing left to right or vice versa, said apparatus including:

a page buffer containing a representation of said symbols in a predetermined order, each such representation including an address/escape pointer,

a column position escape memory specifying for each of said rows of symbols a page buffer pointer to a first symbol in said row and a height factor identifying a space allotted for presentation of said symbol row,

an address escape memory with a record for each different symbol containing a font pointer and a representation of space allotted for said symbol in orthogonal directions,

a font memory with a record for each symbol providing a graphic representation of said symbol,

first means responsive to a print command specifying a specific relation between symbol rows, scan direction and scan progression for accessing said column position escape memory to identify an initial symbol for a selected row of symbols by said page buffer pointer,

second means responsive to said first means for accessing a corresponding entry in said page buffer including said address/escape pointer,

third means responsive to said second means for accessing said address escape and font memories to select a predetermined portion of a corresponding graphic representation, and for deriving output information related to said portion of said graphic representation,

addressing means responsive to said print command and to said second and third means for deriving additional output information of additional symbols.

4,893,258

DATA PROCESSING APPARATUS HAVING ENLARGEMENT/REDUCTION FUNCTIONS CAPABLE OF SETTING DIFFERENT MAGNIFICATION IN DIFFERENT DIRECTIONS

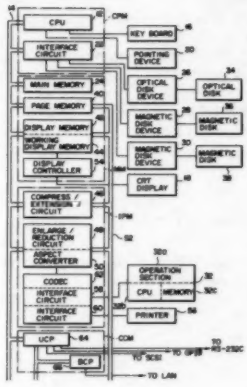
Hiroshi Sakuragi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1988, Ser. No. 149,222

Claims priority, application Japan, Jan. 28, 1987, 62-15962

Int. Cl.[4] G06F *15/20*; H04N *1/04*

U.S. Cl. 364—521 **22 Claims**



1. A data processing apparatus comprising:

means for displaying data to be processed;

first designating means for designating an amount of either an enlarging or reducing magnification ratio in a vertical direction of said data displayed on said displaying means;

second designating means for designating an amount of either an enlarging or reducing magnification ratio in a horizontal direction of said data displayed on said display means; and

means for changing a displayed size of said data displayed on said displaying means in accordance with said amount of either the enlarging or reducing magnification ratio in a vertical direction designated by said first designating means and said amount of either the enlarging or reducing magnification ratio in the horizontal direction designated by said designating means;

wherein said first designating means includes;

means for generating first conversion ratio data representing either the enlarging or reducing ratio in the vertical direction of said data;

first conversion ratio memory means for storing the first conversion ratio data;

fixing means for calculating first physical positions of pixels of the data before either enlargement or reduction operation of the data is performed, calculating second vertical positions of the pixels of the data after either the enlargement or reduction operation of the data is performed in accordance with the first vertical positions of the pixels and the first conversion ratio, and calculating either an enlargement or reduction ratio of the data to obtain vertical position determination signals; and

computing means for computing vertical position data of object pixels after either the enlargement or reduction of the data is performed based on the vertical position determination signals and vertical reference pixels ex-

tracted from the pixels of the data before either the enlargement or reduction of the data is performed; and

wherein said second designating means includes:

means for generating second conversion ratio data representing either the enlarging or reducing ratio in the horizontal direction of said data;

second conversion ratio memory means for storing the second conversion ratio data;

fixing means for calculating first horizontal positions of pixels of the data before either enlargement or reduction operation of the data is performed, calculating second horizontal positions of the pixels of the data after either the enlargement or reduction operation of the data is performed in accordance with the first horizontal positions of the pixels and the second conversion ratio, and calculating either an enlargement or reduction ratio of the data to obtain horizontal position determination signals; and

computing means for computing horizontal position data of object pixels after either the enlargement or reduction of the data is performed based on the horizontal position determination signals and horizontal reference pixels extracted from the pixels of the data before either the enlargement or reduction of the data is performed.

4,893,259

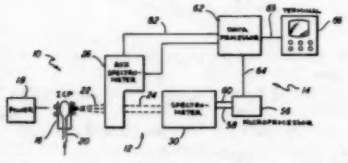
STANDARDIZATION OF SPECTRAL LINES

Zoe A. Grosser, Fairfield; John B. Collins, Westport, and Ewa M. Pruszkowski, Bethel, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 2, 1988, Ser. No. 201,510

Int. Cl.[4] G01J *3/36*; G01N *21/64*

U.S. Cl. 364—525 **8 Claims**



4. An optical spectrometer comprising:

radiation means for generating a spectral input beam characteristic of a plurality of atomic elements including a sample element, a reference element and a standard element;

separation means for separating the input beam into a sample spectral line characteristic of the sample element, a reference spectral line characteristic of the reference element, and a standard spectral line characteristic of the standard element;

first measuring means for measuring at a first time an intensity I_A of the sample line and a first intensity I_{R1} of the reference line;

second measuring means for measuring at a second time different than the first time an intensity I_S of the standard line and a second intensity I_{R2} of the reference line;

computing means responsive to the first and second measuring means for computing an intensity ratio IR defined by the formula

$$IR_O = \left(\frac{I_A}{I_{R1}}\right) \div \left(\frac{I_S}{I_{R2}}\right)$$

wherein the intensity ratio IR_O is representative of a standardized intensity of the sample line compensated for source fluctuations.

4,893,260

THREE-DIMENSIONAL GEOMETRY PROCESSING METHOD AND APPARATUS THEREFOR

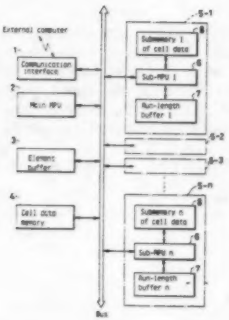
Yoshiki Arakawa, Yawata, Japan, assignor to Matsushita Electric Industrial Company, Ltd., Kadoma, Japan

Filed Jan. 19, 1988, Ser. No. 145,084

Claims priority, application Japan, Jan. 19, 1987, 62-9333

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—564 **6 Claims**



1. A three dimensional geometry processing method comprising the steps of:

defining a three dimensional geometry by a predetermined three dimensional coordinate system,

dividing said three dimensional solid geometry into three dimensional solid geometry elements with respect to the predetermined three dimensional coordinate system,

storing data of said three dimensional solid geometry elements,

setting a reference plane divided into a predetermined grid size in said three dimensional coordinate system,

setting scanning lines having a predetermined thickness and being perpendicular to said reference plane on said grid,

obtaining a run-length representing an intersection of said scanning line and said three dimensional solid geometry elements,

storing data of said run-length,

creating one run-length by combining superimposing plural run-lengths,

storing cell data representing respective all volumes made by dividing an analysis domain which encloses said three dimensional solid geometry,

calculating a volume of said three dimensional solid geometry, which is represented by an integration of said run-length in said cell, and

calculating an occupation ratio of said volume of said cell and said volume of said solid geometry which is occupied in said cell.

4,893,261

APPARATUS AND METHOD FOR DETERMINING AIRSPEED AND DIRECTION

William W. Flint, III, West Hartford, and Richard C. Filipkowski, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1987, Ser. No. 123,421

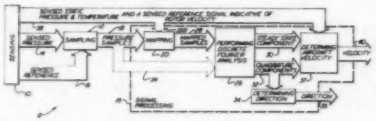
Int. Cl.[4] G01C *21/00*

U.S. Cl. 364—565 **16 Claims**

1. Apparatus for providing an airspeed signal indicative of an aircraft's velocity relative to an air mass surrounding the aircraft and for providing a direction signal indicative of the aircraft's direction in the air mass with respect to a frame of reference fixed in the aircraft, the aircraft having a plurality of signals available, including: (i) a sensed signal indicative of

pressure at an end of a rotating member, (ii) a sensed periodic reference signal indicative of the rotating member periodically passing a reference position relative to the frame of reference, and (iii) a sensed signal indicative of static pressure of the air mass, the apparatus comprising:

sampling means for selectively sampling the magnitude of the sensed pressure signal according to the position of the rotating member for each of a plurality of subrevolution intervals determined with respect to the sensed periodic reference signal, said sampling means providing sampled signals having magnitudes indicative of said magnitude of



the sensed pressure signal during each of said plurality of subrevolution intervals;

signal processing means, responsive to said sampled signals for providing Fourier component signals having magnitudes indicative of Fourier component representations of the pressure at the end of the rotating member, said signal processing means utilizing said component signals and the static pressure signal for determining aircraft velocity and direction, said signals processing means providing the airspeed and direction signals having magnitude indicative thereof.

4,893,262

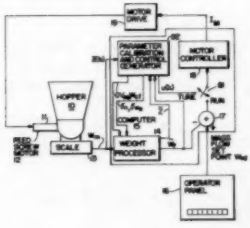
WEIGH FEEDING SYSTEM WITH SELF-TUNING STOCHASTIC CONTROL

Paul R. Kalata, Cherry Hill, N.J., assignor to K-Tron International, Inc., Pitman, N.J.

Continuation of Ser. No. 174,976, Mar. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 879,430, Jun. 27, 1986, Pat. No. 4,775,949. This application Apr. 28, 1989, Ser. No. 344,458

Int. Cl.[4] G01G *13/00*; B67D *5/14*

U.S. Cl. 364—567 **8 Claims**



8. A weigh feeding system comprising:

a means for storing material;

means for discharging material from said means for storing;

means for sensing a weight of the stored material or a weight of the material being discharged;

means for deriving an estimated weight state of the material being weighed and an estimated mass flow state of the material being discharged, from said sensed weight using a Kalman filter means including a noise model of at least one noise process which causes said sensed weight to differ from an actual weight state of the material being weighed, and including a control model;

means for automatically calibrating said noise model and said control model;

means for calculating a set-point error proportional to a difference between said estimated mass flow state and a desired mass flow state;

means for calculating a weight control signal according to said set-point error and according to a magnitude of said set-point error relative to said desired mass flow state; and

means for controlling said means for discharging according to said weight control signal to discharge material from said means for storing at said desired mass flow state.

4,893,263

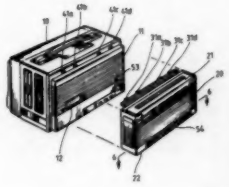
SUPPORT APPARATUS FOR PORTABLE COMPUTER EXPANSION UNIT

Stephen M. Myers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 12, 1987, Ser. No. 13,649

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—708 **7 Claims**



1. A support apparatus for a computer expansion unit said support apparatus comprising:

a computer frame having a first mating electrical connector and a first set of horizontal ribs on a first mating surface;

a computer expansion unit having a second mating electrical connector and a second set of horizontal ribs on a second mating surface, the second set of ribs being sized and positioned to engage the first set of ribs such that the first mating surface of the computer frame provides support by way of the engagement of the sets of ribs for the second mating surface of the computer expansion unit when the fist mating electrical connector is connected to the second mating electrical connector; and

the computer expansion unit having means for releasably locking the second mating surface of the computer expansion unit to the first mating surface of the computer frame.

4,893,264

DIGITAL DECIMATION FILTER

Tobias Noll, Neufahrn, and Stefan Meier, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 224,018

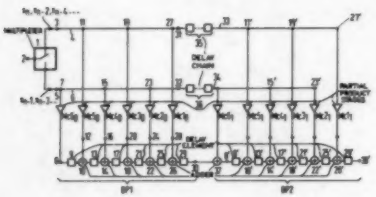
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729172

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724.1 **3 Claims**

1. A digital decimation filter comprising a multiplexer (1) which receives an input signal and which has two outputs (3, 5) respectively connected to first and second signal paths (4, 6), with said first signal path (4) receiving the even-numbered signal values of an input signal which is supplied to said multiplexer (1) at a prescribed sampling rate and said second signal path (6) receives the odd-numbered signal values, a plurality of multipliers which weight the signal values with a plurality of binary filter coefficients and alternately connected to said first and second paths, a first plurality of adders (10, 14, 18, 22, 26) connected in a first iterative circuit for adding the weighted signal values, each of said plurality of multipliers divided into a plurality of partial product stages ($Mc6_0$, $Mc6_1$, . . . $Mc1_0$,

$Mc1_1$) which correspond in number to the place number of the binary filter coefficients (c6 . . . c1), each of said partial product stages performing a weighting based on one filter coefficient bit; said partial product stages ($Mc6_0$ . . . $Mc1_0$) weighting in according to the filter coefficient bits which have the lowest significance ($c6_0$ . . . $c1_0$) are connected between the signal paths (4, 6) of said first signal path and first inputs of said first plurality of adders (10, 14, 18, 22, 26), a first plurality of time delay elements (13, 17, 21, 25) connected between individual ones of said first plurality of adders; and a first delay element (9) is switched between a first adder (10) and a first partial stage ($mc6_0$), third and fourth signal paths (33, 34) provided for each, further filter coefficient bit ($c6_1$ . . . c1) which has a higher significance, said third and fourth signal paths respectively, connected to said first and second signal paths (4, 6) through first and second delay chains (35, 36); an additional iterative circuit (8' . . . 30') including a further plurality of



adders (10', 14', 18', 22', 26') for each of the further filter coefficient bits ($c6_1$ . . . $c1_1$) and for each of said further filter coefficient bits ($c6_1$ . . . $c1_1$), additional plurality of partial product stages ($Mc6_1$ . . . $Mc1_1$) are provided which weigh according to the filter coefficient bits are connected between said third and fourth signal paths (33, 34) and said further plurality of adders (10, 14', 18', 22', 26') connected, respectively, to the outputs of said additional plurality of partial product stages, a further plurality of time delay elements (13', 17', 21', 25') respectively connected to said further plurality of adders; and a second delay element (9') is switched between a second adder (37) and a third adder (37) and said second adder (37) is connected to receive the output of a second partial product stage ($Mc6_1$) and the output of the proceeding chain circuit (8–30); and the output (30') of said additional iterative circuit (8' . . . 30') corresponding to the filter coef .cient bit which has the highest significance.

4,893,265

RATE CONVERSION DIGITAL FILTER

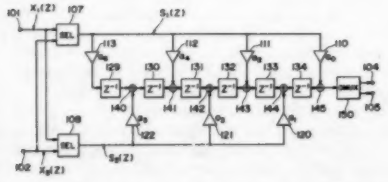
Botaro Hirosaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,147

Claims priority, application Japan, Nov. 8, 1984, 59-235409

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724.10 **4 Claims**



1. A finite impulse response digital filter responsive to first and second digital data streams each being sampled at intervals T, comprising:

a first multiplexer for alternately selecting samples of said first and second data streams at intervals t:

a second multiplexer for alternately selecting samples of said first and second data streams at intervals T in a manner complementary to said first multiplexer;

a plurality of storage means arranged in successive stages comprising at least first and last stages, and being simultaneously clocked at intervals T for introducing a unit delay time T in each of said storage means;

first multiplier means having a first plurality of ordered output terminals, comprising at least a first output terminal, for multiplying an output of said first multiplexer by first multiplying factors and generating at said first plurality of output terminals a plurality of first multiplied samples, said first ordered output terminal being connected to the first stage of said storage means;

second multiplier means having a second plurality of ordered output terminals, comprising at least a first output terminal, for multiplying an output of said second multiplexer by second multiplying factors and generating at said second plurality of output terminals a plurality of second multiplied samples; and

a plurality of summation means each having first and second input terminals and an output terminal, the first input terminals and the output terminals of all but one of said plural summation means being respectively connected between successive ones of said storage means, said one summation means being connected to an output terminal of said last storage stage and said output terminal of said one summation means being a filter output terminal, first alternate ones of said second input terminals of said summation means being connected to output terminals of said first multiplier means and second alternate ones of said second input terminals of said summation means being connected to output terminals of said second multiplier means for providing summation of said first multiplied samples respectively with outputs of alternate ones of said storage means, and providing summation of said second multiplied samples respectively with outputs of the other storage means, whereby a summation of multiplied samples of each of said first and second data streams alternately appears at intervals 2T at said filter output terminal.

4,893,266

ALIAS TAGGING TIME DOMAIN TO FREQUENCY DOMAIN SIGNAL CONVERTER

Jake O. Deem, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 56,617, Jun. 1, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 284,777

Int. Cl.[4] G06F *15/353*

U.S. Cl. 364—726 **11 Claims**

1. A time domain to frequency domain signal converter comprising:

a terminal for receiving an input signal capable of exhibiting one of a plurality of frequencies;

means for performing a first fourier transform, said first fourier transform performing means having an input coupled to said terminal and having an output of providing a first signal corresponding to a particular one of the plurality of frequencies of said input signal;

means, having an input coupled to said terminal and having an output, for delaying the input signal;

means for performing a second fourier transform, said second fourier transform performing means having an input coupled to the output of said delaying means and having an output for providing a second signal corresponding to a particular one of the plurality of frequencies of said delayed input signal;

means, having an input coupled to the output of said first

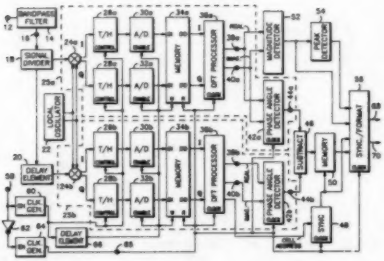
fourier transform performing means and having an output, for calculating signal phase of the first signal;

means, having an input coupled to the output of said second fourier transform performing means and having an output for calculating signal phase of the second signal;

means, coupled to the outputs of said means for calculating signal phase of the first and second signal, for calculating a phase difference between the first and second signals;

each of the plurality of frequencies of the input and the delayed input signals is not greater than a maximum one of the plurality of frequencies, the maximum one of the plurality of frequencies corresponds to a maximum frequency transformed by said first and second fourier transform performing means;

first means, having an input coupled to said terminal and having an output coupled to the input of said first fourier



transform performing means, for sampling the input signal at a predetermined sample rate so that fewer than two samples for each complete oscillation of the maximum transformed frequency occur;

second means, having a delay input coupled to the output of said delaying means and having an output coupled to the input of said second fourier transform performing means, for sampling the input signal at the predetermined sample rate; and

band pass filter means having an output coupled to said terminal, said band pass filter means being configured so that said band pass filter means transmits, with low level attenuation, frequencies of the input signal which correspond to frequencies transformed by said first and second fourier transform performing means that exhibit more than one complete oscillation for each two samples at the predetermined sample rate.

4,893,267

METHOD AND APPARATUS FOR A DATA PROCESSOR TO SUPPORT MULTI-MODE, MULTI-PRECISION INTEGER ARITHMETIC

Mitchell Alsup, Dripping Springs; Yoav Talgam, Tel Aviv, Israel, and Marvin A. Denman, Austin, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1988, Ser. No. 265,437
Int. Cl.[4] G06F 7/38
U.S. Cl. 364—745 **3 Claims**

1. In a data processor comprising:

an instruction register for sequentially receiving and storing each of a plurality of instructions for execution by the data processor;

an execution unit, including an arithmetic unit having addition/subtraction carry logic and overflow logic, for selectively executing each of said instructions stored in the instruction register; and

an instruction execution control unit for controlling the operation of the execution unit in the execution of each of said stored instructions;

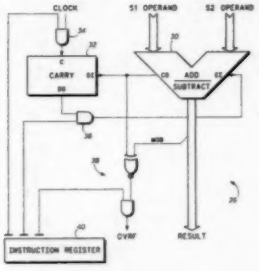
the improvements wherein a selected one of said instructions includes;

a carry-in enable field;

a carry-out enable field;

an overflow enable field;

and wherein, in response to the storage of said selected one of said instructions in the instruction register, the carry logic of



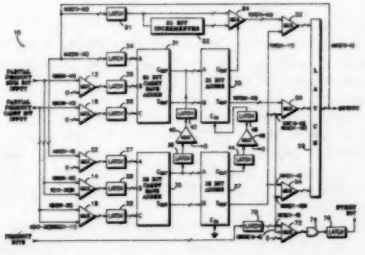
the arithmetic unit is enabled to accept a carry-in bit in response to a first predetermined value in said carry-in enable field and to selectively provide a carry-out bit in response to a second predetermined value in siad carry-out enable field, and the overflow logic of the arithmetic unit is enabled to selectively provide an overflow signal indicating an overflow of bits in the arithmetic unit in response to a third predetermined value in said overflow control field.

4,893,268

CIRCUIT AND METHOD FOR ACCUMULATING PARTIAL PRODUCTS OF A SINGLE, DOUBLE OR MIXED PRECISION MULTIPLICATION

Marvin A. Denman, Jr.; John M. Young, both of Austin, and Mitch K. Alsup, Dripping Springs, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 15, 1988, Ser. No. 181,865
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—759 **7 Claims**



5. The method of claim 4 wherein the predetermined number of iterations is one when each input operand is a single precision data operand.

4,893,269

ADDER CELL FOR CARRY-SAVE ARITHMETIC

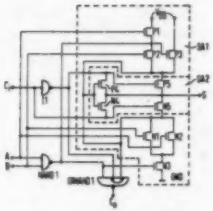
Karl Knauer, Grafing, and Winfried Kamp, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 17, 1989, Ser. No. 324,807

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814639

Int. Cl.[4] G06F 7/50

U.S. Cl. 364—784 3 Claims



1. An adder cell for carry-save arithmetic, comprising an inverter (I1), an NAND Gate (NAND1) and an ORNAND Gate (ORNAND1), means connecting a first and a second sum operand input (A, B) to the NAND Gate (NAND1), means for connecting a carry input (C_i) to the inverter (I1), means connecting an output of the NAND Gate (NAND1) to an AND input of the ORNAND Gate (ORNAND1), means for connecting an output of the inverter (I1) to a first OR input of the ORNAND Gate (ORNAND1), a first circuit arrangment (SA1), means for connecting the first and second operand inputs (A, B) and the output of the NAND Gate (NAND1) to said first circuit arrangement (SA1), a second circuit arrangement (SA2), means for connecting the carry input and the output of the inverter (I1) to said second circuit arrangement (SA2); means for connecting a first output of said first circuit arrangement (SA1) to a second OR input of said ORNAND Gate (ORNAND1), and means for connecting a second, third and fourth output of the first circuit arrangement (SA1) to the second circuit arrangement (SA2); whereby an output of the second circuit arrangement (SA2) forms a sum output (S) and an output of the ORNAND Gate (ORNAND1) forms a carry output (C_0).

4,893,270

MEDICAL INFORMATION SYSTEM

Roger P. Beck, Reynoldsburg; Daniel L. Castagno, Pickerington; Robert B. Craig, Jr., Westerville; Timothy S. Davidheiser, Reynoldsburg; Allen W. Haley, Jr., Columbus; Stanley M. Huff, Westerville, and Russell P. Radigan, Johnstown, all of Ohio, assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 12, 1986, Ser. No. 862,094

Int. Cl.[4] G06F 15/16, 15/42

U.S. Cl. 364—900 16 Claims

2. A medical information system (1) having a plurality of interconnected computer terminals (1000) each defined by station requirements file data (10015):

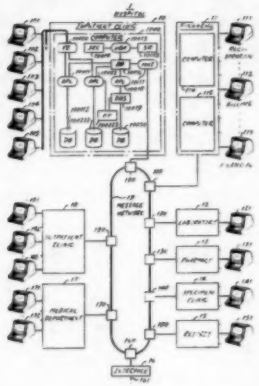
characterized in that

said medical information system comprises

means (10010, 10011, 10022) for entering record and medical data into one of the computer terminals and recording said record and medical data in forms files and medical data dictionary data bases (100112, 100222) of the computer terminal,

means (19, 10011, 10017, 10018, 10022) for accessing said recorded record and medical data at predetermined intervals of time and transmitting said accessed record and medical data to each of the interconnected computer terminals, and

means (10011, 10013, 10014, 10018, 10022) for modifying said transmitted record and medical data at each computer terminal in accordance with the computer terminal station requirements file data and recording said modified record and medical data in the computer terminal forms files and



medical data dictionary data bases (100112, 100222) for use in entering patient data into a patient file data base (10030) of the computer terminal consistent with said station requirements file data and said modified record and medical data.

4,893,271

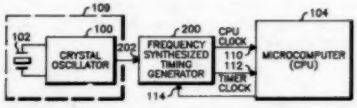
SYNTHESIZED CLOCK MICROCOMPUTER WITH POWER SAVING

Walter L. Davis, Plantation; Barry W. Herold, Lauderhill, both of Fla., and Wendell L. Little, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 842,056, Mar. 18, 1986, abandoned, which is a continuation of Ser. No. 549,954, Nov. 7, 1983, abandoned. This application Feb. 26, 1987, Ser. No. 18,761

Int. Cl.[4] G06F 1/04, 7/38

U.S. Cl. 364—900 23 Claims



1. A microcomputer system capable of operating with minimum power comprising:

a central processing unit including means designating the predetermined clock pulse frequency requirements of the central processing unit for the immediate execution of programmable tasks;

stable frequency source producing timing pulses at a frequency less than the largest in magnitude of the predetermined clock pulse frequency requirements of the central processing unit; and

a frequency synthesizer coupled to and receiving timing pulses from said stable frequency source, said frequency synthesizer being coupled to said central processing unit for generating and supplying synthesized clock pulses to said central processing unit, said synthesizer including selecting means, responsive to said designating means, for selecting an output frequency of the synthesized clock

pulses equal to the predetermined clock pulse frequency requirements of said central processing unit;

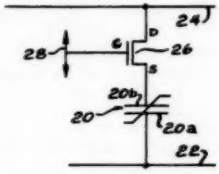
whereby the total power consumed by the elements of the microcomputer system is minimized by the operation of the stable frequency source at a frequency less than the largest in magnitude of the clock pulse frequency requirements of the central processing unit and the generation by the frequency synthesizer and supply of clock pulse frequencies to the central processing unit is no greater than that required for the immediate execution of programmable tasks.

4,893,272

FERROELECTRIC RETENTION METHOD

S. Sheffield Eaton, Jr.; Douglas Butler, and Michael Parris, all of Colorado Springs, Colo., assignors to Ramtron Corporation, Colorado Springs, Colo.

Filed Apr. 22, 1988, Ser. No. 184,996
Int. Cl.[4] G11C *7/00, 11/22*
U.S. Cl. 365—145 **6 Claims**



1. A method of operating a ferroelectric capacitor having first and second electrodes with a ferroelectric dielectric therebetween to improve data retention therein comprising the steps of:

generating a write pulse;

coupling said write pulse to said first electrode of said capacitor via a switching device coupled to said first electrode; then disconnecting the write pulse from said first electrode by opening said switching device prior to terminating said write pulse, and then

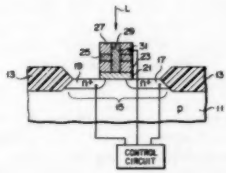
terminating said write pulse, whereby dipoles in said ferroelectric dielectric are maintained in an aligned position.

4,893,273

SEMICONDUCTOR MEMORY DEVICE FOR STORING IMAGE DATA

Toshiro Usami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1986, Ser. No. 842,193
Claims priority, application Japan, Mar. 28, 1985, 60-62102
Int. Cl.[4] G11C *11/40;* **H01L** *29/78*
U.S. Cl. 365—185 **9 Claims**



9. A memory device for storing image data including a memory cell comprising:

a semiconductor body;

a source region and a drain region formed in said semiconductor body;

a first gate insulating film formed on a channel region between said source and drain regions;

a floating gate electrode formed on said first gate insulating film;

a second gate insulating film formed on said floating gate electrode;

a control gate electrode formed on said second gate insulating film;

means for guiding light incident on said memory cell onto at least said channel region; and

means for applying a first predetermined voltage to said control gate electrode and applying a second predetermined voltage across said source and drain regions, thereby causing said floating gate electrode to accumulate therein electrons of electron-hole pairs generated in said channel region in accordance with an amount of light guided by said light guiding means, and causing said memory cell to store binary data therein based on a change in the threshold level of said memory cell corresponding to the amount of electrons accumulated in said floating gate electrode,

said first and second predetermined voltages being determined in accordance with a threshold level at which light conducted by said guiding means is determined to be present or absent, a high second predetermined voltage being applied across said source and drain regions to lower said threshold level and a low second predetermined voltage being applied across said source and drain regions to raise said threshold level,

wherein said light guiding means comprises means for guiding light onto said channel region through said first and second gate insulating films, said floating gate electrode, and said control gate electrode,

wherein said light guiding means comprises a light-transmitting material forming an optical path extending through said first and second gate insulating films, said floating gate electrode, and said control gate electrode, and

wherein said first gate insulating film comprises a light-transmitting material;

said floating gate electrode, said second gate insulating film, and said control gate electrode each has an opening therethrough in communication with each other; and

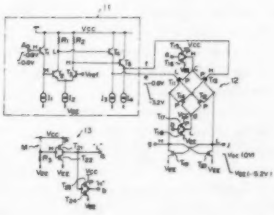
said light-transmitting material is disposed in said openings forming said optical path through said first gate insulating film.

4,893,274

SEMICONDUCTOR MEMORY DEVICE HAVING LEVEL CONVERTERS

Isao Fukushi, Yokohama, Japan, assignor to Fujutsu Limited, Kawasaki, Japan

Filed Oct. 24, 1988, Ser. No. 261,298
Claims priority, application Japan, Oct. 30, 1987, 62-273481
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189.04 **5 Claims**



1. A semiconductor memory device having a plurality of level converters, each of said plurality of level converters comprising:

a bridge circuit constituted by four MOS transistors having one type of conductivity, gates of one pair of said four transistors opposing each other receiving a first signal, gates of the other pair of said four transistors opposing each other receiving a signal complementary to said first signal;

a pair of complementary MOS inverter circuits to which a second signal and a signal complementary to said second signal are input, respectively, the outputs of said pair of inverter circuits being connected to a first pair of connecting points positioned alternately in said bridge circuit, respectively; and

a flip-flop circuit connected between a second pair of connecting points positioned alternately in said bridge circuit, to thereby output a third signal and a signal complementary to said third signal from said second pair of connecting points, respectively.

4,893,275

HIGH VOLTAGE SWITCHING CIRCUIT IN A NONVOLATILE MEMORY

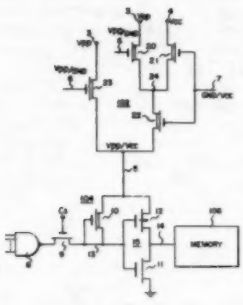
Sumio Tanaka; Shigeru Atsumi, both of Tokyo; Nobuaki Ohtsuka, and Keniti Imamiya, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1988, Ser. No. 173,563

Claims priority, application Japan, Mar. 31, 1987, 62-78522

Int. Cl.[4] G11C *7/00*; G05F *3/16*; H03K *3/01*

U.S. Cl. 365—189.09 **3 Claims**



1. A nonvolatile semiconductor memory device with a power voltage select circuit, wherein said power voltage select circuit comprises:

first and second power source nodes;

third and fourth nodes;

an output node;

first and second depletion type MOS transistors having source-drain paths connected in series between said first power source node and said output node, the gates of said first and second depletion type MOS transistors being connected to said third node;

a third MOS transistor having a source-drain path connected between an interconnection point which is between the source-drain paths of said first and second depletion type MOS transistors and said second power source node, the gate of said third MOS transistor being directly connected to said fourth node; and

a fourth MOS transistor having a source-drain path connected between said second power source node and said output node, the gate of said fourth MOS transistor being directly connected to said fourth node.

4,893,276

OUTPUT CIRCUIT OF A STATIC RANDOM ACCESS MEMORY CIRCUIT

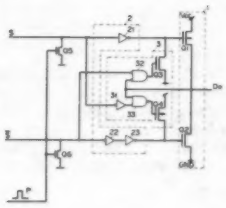
Hiroaki Okuyama, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Nov. 29, 1988, Ser. No. 277,195

Claims priority, application Japan, Dec. 3, 1987, 62-306345

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189.08 **4 Claims**



1. An output circuit of a static random access memory comprising:

a memory cell block containing plural memory cells;

output control means for receiving internal data changed depending on the data in any one of said plural memory cells selected by an address signal;

data output means composed of P-channel and N-channel MOS FETs of which sources are connected to two supply potentials, in which an output signal of said output control means is applied to the gates of said P-channel and N-channel MOS FETs for on/off control, and an output potential at a connection point of the drains of said P-channel and N-channel MOS FETs is changed to a potential level corresponding to data in said selected memory cell; and

intermediate potential setting means for setting said output potential of said data output means to an intermediate potential between an immediately preceding output potential of said data output means and one of said supply potentials, after a transition of said address signal and before a change of said internal data, on the basis of said transition of said address signal and said output potential of said data output means, in which

said output control means changes said output potential of said data output means from said intermediate potential to a potential corresponding to data in said selected memory cell, after transition of said address signal and after change of said internal data.

4,893,277

SEMICONDUCTOR MEMORY

Kazuhiko Kajigaya, and Katsuyuki Sato, both of Gakuennishi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 878,072, Jun. 24, 1986, Pat. No. 4,780,852.

This application Oct. 11, 1988, Ser. No. 255,314

Claims priority, application Japan, Jun. 26, 1985, 60-137733

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—203 **20 Claims**

1. A semiconductor memory comprising:

a plurality of memory arrays each including pairs of data lines, word lines intersecting said pairs of data lines, and memory cells respectively provided at the intersections between said pairs of data lines and said word lines, wherein each of said memory cells includes a MOSFET and a capacitor coupled to said MOSFET for storing data;

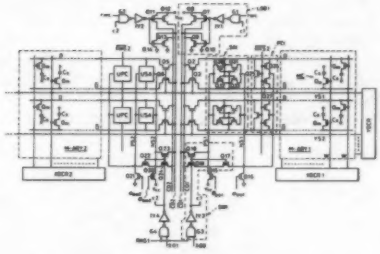
precharge means for precharging said pairs of data lines to a potential which is substantially medium between first and second potentials;

pairs of common data lines provided respectively corresponding to said memory arrays;

first switching means for connecting each of said pairs of common data lines to each of said pairs of data lines in the memory array which said switching circuit respectively corresponds to;

a plurality of word selecting means provided respectively corresponding to said memory arrays, wherein each of said word selecting means selects one of said word lines;

column selecting means provided in common with respect to said memory arrays, said column selecting means including means for connecting each of said pairs of common data lines respectively to one pair of data lines selected



from among said pairs of data lines in each of said memory arrays by means of said switching means on the basis of a common column selecting signal;

memory array selecting means for selecting one of said plurality of memory arrays so that a memory cell is selected by the respective operation of said column selecting means, said plurality of word selecting means, and said memory array selecting means; and

voltage supply means for supplying a potential having a substantially identical potential to said medium potential to a pair of common data lines corresponding to a memory array which is not selected by said memory array selecting means when said memory array selecting means selects one of said memory arrays.

4,893,278

SEMICONDUCTOR MEMORY DEVICE INCLUDING PRECHARGE/EQUALIZATION CIRCUITRY FOR THE COMPLEMENTARY DATA LINES

Akira Ito, Kunitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 60,334

Claims priority, application Japan, Jun. 13, 1986, 61-135909

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—203 **24 Claims**

1. A semiconductor memory device comprising:

a plurality of word lines and a plurality of complementary data line pairs;

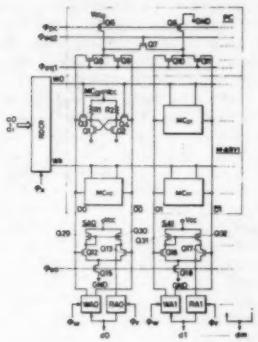
a plurality of memory cells coupled to said plurality of word lines and said plurality of complementary data line pairs forming a grid-like memory matrix arrangement wherein each memory cell is connected to a word line and to a complementary pair of data lines; and

a plurality of precharge circuit means for precharging a plurality of complementary data line pairs, each one of said precharge circuit means being coupled so as to precharge two adjacent pairs of said complementary data lines; and each precharge circuit means comprising:

means for supplying a first voltage to one pair of said two complementary data line pairs,

means for supplying a second voltage, different than said first voltage, to the other pair of said two complementary data line pairs, and

equalization means for effecting a short circuit between at least one data line of said one pair of said two complemen-



tary data line pairs and at least one data line of said other pair of said two complementary data line pairs wherein there is provided a substantially equal potential at each of the data lines of said two complementary data line pairs during a precharging mode of operation.

4,893,279

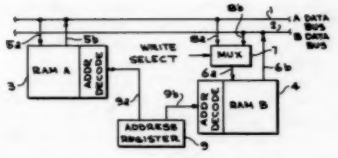
STORAGE ARRANGEMENT HAVING A PAIR OF RAM MEMORIES SELECTIVELY CONFIGURABLE FOR DUAL-ACCESS AND TWO SINGLE-ACCESS RAMS

Mahboob F. Rahman, Sunnyvale; Dakshesh D. Parikh, San Jose; Marita E. Daly, El Cerrito, and Bu-Chin Wang, Saratoga, all of Calif., assignors to Advanced Micro Devices Inc., Sunnyvale, Calif.

Continuation of Ser. No. 836,024, Mar. 4, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 309,976

Int. Cl.[4] G11C *7/00, 8/00*; **G06F** *12/00, 13/00*

U.S. Cl. 365—230.03 **7 Claims**



1. A memory arrangement having first and second storage modes for use with a digital signal processor comprising in combination,

(a) first and second data buses connected to said signal processor,

(b) first and second memories, each of which includes a plurality of addressable data storage locations,

(c) first transferring means connected between said first data bus and said first memory for transferring first data between said first memory and said first data bus during said first and second modes,

(d) second transferring means connected between said second second memory and said first and second data busses for

(1) transferring said first data from said first data bus to said second memory and from said second memory to said second data bus during said first mode, and

(2) transferring second data from said first data bus to said

second memory and from said second memory to said second data bus during said second mode,

(e) addressing means connected to said memories for supplying addresses to said first and second memories, and

(f) control means, connected to said addressing means and said transferring means, operable in response to;

(1) a first mode signal to cause said first data on said first data bus to be simultaneously stored in corresponding locations of said first and second memories and subsequently during said first mode to be simultaneously transferred from said corresponding said locations to said first and second data busses, and

(2) a second mode signal to cause said first data and said second data from said first data bus to be stored in corresponding said locations of said first and second memories respectively during said second mode and subsequently transferred during said second mode to said first and second data busses, respectively.

7. A method for use with a digital signal processor to control the dual mode transfer of first and second operands between a memory storage system and a pair of data busses connected to said signal processor, said system including,

(A) first and second random access memories, each said memory having a,

(a) separate addressing means for addressing storage locations in said memory, and

(b) separate write and read cycles for transferring data between each said memory and said pair of data busses, and

(B) means connected to said separate addressing means for generating addresses for said separate addressing means, said method comprising the following combination of steps;

(1) storing one operand from one said data bus of said pair of data busses during one said mode in said first memory at a first said storage location and simultaneously the same said operand in said second memory at a said location corresponding to said first location by generating said write cycles simultaneously for said memories,

(2) simultaneously transferring during said one mode said one operand from said first memory and said same said operand from said second memory, to said pair of data busses by generaating said read cycles simultaneously for said memories,

(3) storing during a second said mode, first and second different operands from said one data bus, at said locations in said first and second memories by generating write cycles for said memories at different times corresponding to when said different operands are on said one data bus, and

(4) simultaneously transferring during said second said mode said first and second operands from said first and second memories respectively to said pair of data busses by generating said read cycles simultaneously for said first and second memories.

4,893,280

DUAL PORT RANDOM ACCESS MEMORY HAVING VARIABLY CUSTOMIZED ORGANIZATION OF MEMORY BIT UNITS

Tito Gelsomini, Rieti, and Pasqualino Fiorentino, Rome, both of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 26, 1988, Ser. No. 148,457

Claims priority, application Italy, Feb. 27, 1987, 47682 A/87

Int. Cl.[4] G11C *8/00, 7/00;* **G06F** *7/50, 11/00*

U.S. Cl. 365—230.05 **8 Claims**

1. A dual port random access memory having a variably customized organization of memory bit units, said random access memory comprising:

a memory array having a plurality of memory cells arranged in a matrix;

first and second data ports;

said first data port having a plurality of input/output terminal pins connected to input/output lines coupled to said memory array, said first data port also having a first plurality of address pins coupled to corresponding address lines;

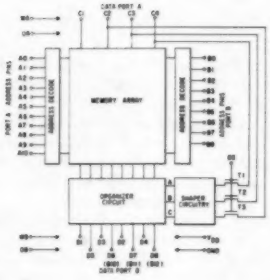
said second data port having a plurality of input/output terminal pins connected to input/output lines coupled to said memory array, said second data port also having a second plurality of address pins coupled to corresponding address lines;

at least one of said first and second data ports being organizable to provide for a variable number of operable input-/output terminal pins and input/output lines for accommodating sets of data bits of a variable number of bits in length and a variable number of address pins and address lines;

a first address decoder interposed between said first plurality of address lines and said memory array and respectively coupled thereto;

a second address decoder interposed between said second plurality of address lines and said memory array and respectively coupled thereto;

said organizable data port including said plurality of address



pins providing a set of address pins for application of address signals thereto and n data input/output pins connected to n input/output lines;

memory organizer means interposed between said memory array and said organizable data port, said memory organizer means being connected to said n data input/output pins of said organizable data port via said n input/output lines and to said memory array;

means driving said memory organizer means by a selected number of signals numbering from one up to m number of signals to enable respective sets of bits comprising a variable number of bits for access to said memory array through selected sets of input/output terminal pins of said organizable data port, wherein each set of input/output terminal pins is comprised of a number of terminal pins different from the number of terminal pins in another set; and

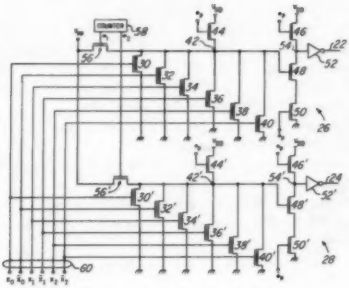
said n data input/output pins of said organizable data port being convertible up to a corresponding number m thereof to be organized into a corresponding number m of additional address pins with respect to said organizable data port in dependence upon the driving of said memory organizer means by a selected number of signals.

4,893,281

SEMICONDUCTOR MEMORY SYSTEM WITH PROGRAMMABLE ADDRESS DECODER

Masashi Hashimoto, Inashiki, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 25, 1986, Ser. No. 911,926
Claims priority, application Japan, Oct. 8, 1985, 60-225738
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—230.06 **12 Claims**



1. A memory system comprising:
a memory array addressed by a first portion of an address signal;
a first address decoder for generating an output address for said memory array in correspondence to said first portion of said address signal, the first address decoder being programmable and including switches having programmable threshold values, whereby said first address decoder produces a predetermined memory address in response to predetermined addresses represented by said first portion of said address signal;
means for selectively changing the threshold value of said switches to program said first address decoder;
a second address decoder for generating an output in correspondence to a second portion of the address signal; and
an address select detection circuit responsive to the outputs of said first ano second address decoders for enabling and disabling an associated active device based on the outputs of said first and second address decoders.

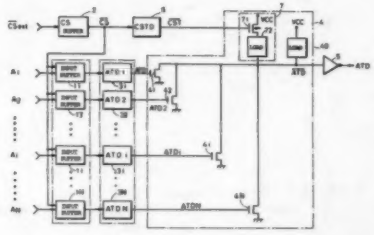
4,893,282

SEMICONDUCTOR MEMORY DEVICE

Tomohisa Wada, and Hirofumi Shinohara, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 809,173, Dec. 16, 1985, abandoned. This application Dec. 7, 1987, Ser. No. 133,153
Claims priority, application Japan, Feb. 26, 1985, 60-39601
Int. Cl.[4] G11C *8/00, 11/40*
U.S. Cl. 365—233.5 **7 Claims**

1. A semiconductor static memory device having a plurality of memory cells comprising:
means for receiving an externally generated, chip selection signal;
first pulse signal generating circuits corresponding to a plurality of address signals designating the addresses of said memory cells for generating selectively a first pulse signal in response to a level change in a corresponding address signal, said chip selection signal being independent of said address signals;
logic circuit means responsive to any of said first pulse signals generated by said first pulse signal generating circuits for generating an output signal to access an addressed one of said memory cells,
a second pulse signal generating circuit for generating a second pulse signal in response to a level change in the chip selection signal, and
a speed control circuit operative in response to said second pulse signal generated by said second pulse signal generating circuit to reduce a response time of said logic circuit means to access the addressed memory cell, wherein
said logic circuit means comprises
a plurality of MOS field-effect transistors respectively provided with gates connected to the outputs of said plurality of first pulse signal generating circuits, sources thereat



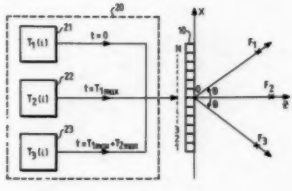
connected to a ground potential and drains thereat connected together,
a first load device connected between a power supply potential and said commonly connected drains of said plurality of MOS field-effect transistors, and
a second load device connected between said power supply potential and said commonly connected drains of said plurality of MOS field-effect transistors, said second load device being controlled by said second pulse signal from said second pulse signal generating circuit.

4,893,283

ECHO ULTRASOUND SYSTEM WITH AN IMPROVED IMAGE SEQUENCE RATE

Patrick R. Pesque, Perigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,612
Claims priority, application France, Dec. 30, 1987, 8718387
Int. Cl.[4] G03B *42/06*
U.S. Cl. 367—7 **2 Claims**



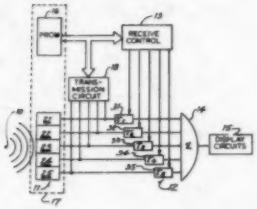
1. In an echo ultrasound imaging system of the type which comprises an array of transducer elements, emission means connected to the array for transmission of ultrasound, and receiving means connected to the array for simultaneous reception of a plurality, M, of focussed ultrasound echo beams from M different directions; the improvement wherein the emission means sequentially transmit M beams in said M different directions and the receiving means simultaneously receive echoes from said M beams.

4,893,284

CALIBRATION OF PHASED ARRAY ULTRASOUND PROBE

Mark G. Magrane, Redmond, Wash., assignor to General Electric Company, Milwaukee, Wis.

Filed May 27, 1988, Ser. No. 199,893
Int. Cl.[4] H04B *11/00*
U.S. Cl. 367—12 **9 Claims**



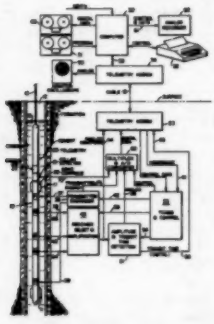
1. A transducer probe assembly comprising:
a plurality of ultrasonic transducers arranged in an array;
means for storing correction values corresponding to time delay . errors inherent in said transducers;
assembly means for carrying said transducers and said correction means; and
conductor means coupled to said transducers and said correction value storing means and carried by said assembly means for permitting said transducers and said correction value storing means to be electrically connected to an ultrasound system.

4,893,285

METHOD AND APPARATUS FOR CEMENT BOND TOOL

Jean P. H. R. M. Masson, Garches, France; Lee H. Gollwitzer, and Robert A. Lester, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 119,443, Nov. 12, 1987, abandoned, which is a division of Ser. No. 394,395, Jul. 1, 1982, Pat. No. 4,757,479. This application May 12, 1988, Ser. No. 195,443
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—35 **25 Claims**



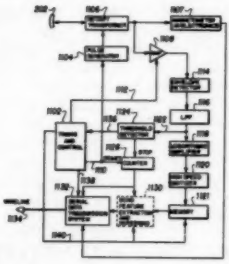
1. A method for obtaining a measure of the quality of a cement bond relative to a casing in a borehole comprising the steps of:
establishing a well tool having two longitudinally spaced acoustic transmitters and at least two longitudinally spaced acoustic receivers disposed between said acoustic transmitters with a transmitter-to-receiver spacing to normally provide for a measurable signal-noise-ratio, the arrival of a casing signal prior to the arrival of a formation signal and to tolerate eccentring of as much as 0.3 inches;
moving the tool through the cased borehole;
repetitively energizing said acoustic transmitters to apply acoustic energy into the casing surrounding said well tool;
detecting at said receivers energy from a first of said transmitters arriving at said receivers by way of said casing;
detecting at said receivers acoustic energy arriving by way of said casing from a second of said transmitters following the firing of said first transmitter;
for each of the foregoing generations and detections, measuring the peak amplitude of a portion of the acoustic casing signals detected at each of said receivers, said portion being selected based on the expected first energy arrival at the respective receiver;
obtaining a ratio of the peak amplitudes associated with the firing of said first transmitter;
obtaining a ratio of the peak amplitudes associated with the firing of said second transmitter;
combining said ratios to produce a function representative of the attenuation of acoustic energy travelling through the casing; and
recording said attenuation as a function of tool position in the borehole.

4,893,286

SYSTEM AND METHOD FOR PREPROCESSING AND TRANSMITTING ECHO WAVEFORM INFORMATION

Wesley N. Cobb, University Heights, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Nov. 4, 1987, Ser. No. 116,309
Int. Cl.[4] G01S *15/02*
U.S. Cl. 367—87 **14 Claims**



1. A method for preprocessing and transmitting echo waveform information derived from an echo of an acoustic wave reflected from a target surface, comprising the steps of:
digitizing an echo waveform produced in response to a launching of an acoustic wave;
detecting amplitude of said echo waveform;
continuously storing said digitized echo waveform in a recirculating memory;
freezing information stored in said recirculating memory during a predetermined time period beginning after the detected amplitude of said echo waveform rises above a predetermined threshold;
measuring a time interval between said launching of the acoustic wave and the rise of said detected amplitude of said echo waveform above said predetermined threshold; and
multiplexing the time interval measured in said measured step and the waveform information frozen in said recalculating memory in said freezing step for transmission to a location remote from said acoustic wave.

4,893,287

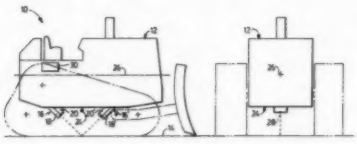
VELOCITY REFERENCE SYSTEM

Kenneth L. Stratton, Chillicothe, and Ali A. Bitar, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 17, 1987, Ser. No. 134,418

Int. Cl.[4] G01S 9/66

U.S. Cl. 367—91 24 Claims



1. A velocity reference system for measuring the speed and distance travelled of a vehicle moving in a direction relative to a surface by means of ultrasonic wave Doppler shifts, said vehicle having a longitudinal axis extending in the direction of vehicle travel, said apparatus comprising:

a first sensing unit adapted to transmit and receive sonic wave energy having a first preselected frequency, said first sensing unit being responsive to received sonic wave energy having a first predetermined bandwidth about said first preselected frequency;

a second sensing unit adapted to transmit and receive sonic wave energy having a second preselected frequency, said second sensing unit being responsive to received sonic wave energy having a second predetermined bandwidth substantially non-overlapping said first bandwidth about said second preselected frequency;

said first sensing unit being adapted for mounting on the vehicle along said longitudinal axis and positioned to transmit sonic wave energy generally downwardly toward the surface, aligned along the longitudinal axis, and generally in the direction of vehicle travel, a portion of said transmitted wave energy being reflected by the surface and received by said first sensing unit;

said second sensing unit being adapted for mounting on the vehicle along the longitudinal axis spaced apart from said first sensing unit and positioned to transmit sonic wave energy generally downwardly toward the surface, aligned along the longitudinal axis, generally towards said first sensing unit and in a direction opposed to vehicle travel, a portion of said transmitted wave energy being reflected by the surface and received by said second sensing unit; and

digital processing means for determining the speed and distance travelled of said vehicle relative to the surface in response to a Doppler shift of said received sonic wave energy.

4,893,288

AUDIBLE ANTENNA ALIGNMENT APPARATUS

Gerhard Maier, Dauchingen, and Veit Armbruster, St. Georgen, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

PCT No. PCT/EP87/00740, § 371 Date Aug. 26, 1988, § 102(e) Date Aug. 26, 1988, PCT Pub. No. WO88/04478, PCT Pub. Date Jun. 16, 1988

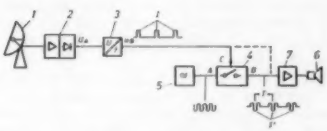
PCT Filed Nov. 28, 1987, Ser. No. 246,541

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641310

Int. Cl.[4] H01Q 3/00

U.S. Cl. 367—116 2 Claims

1. A system for aligning an antenna comprising: means for producing a voltage dependent on alignment; a voltage-to-frequency converter for converting said voltage into a converted signal having a frequency within the audible range and being inversely proportional to said voltage; a switching stage with a control input, said converted signal being applied in form of a switching signal to said control input; said switching stage having an input and an output; an oscillator having an output signal switched over to said input of said switching stage at a constant frequency within the audible range, groups of pulses in said output signal from said oscillator being obtainable at said output of said switching stage in synchronization with said converted signal from said voltage-to-frequency converter, said voltage having a relatively low value when said antenna is substantially misaligned, said converted signal from said converter having a relatively high frequency when said antenna is substantially misaligned and said voltage has a relatively low value; said voltage having a relatively high value when said antenna is in substantial alignment, said converted signal from said converter having a relatively low frequency when said antenna is in substantial alignment and said voltage has a relatively high value, said converted signal being audible to an operator and having a substantially zero frequency sensed easily by said operator when said antenna is in alignment.



4,893,289

PRODUCTION OF DIRECTIONALLY LIMITED ACOUSTIC POWER SPECTRA

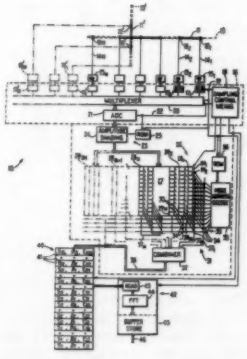
Michael J. Greenwood, Dean Head Farm, Huddersfield Rd., Delph, Oldham, and David P. J. Coughtrie, 5 Darwin Grove, Bramhall, Cheshire, both of England

Filed Mar. 9, 1988, Ser. No. 165,801

Claims priority, application United Kingdom, Mar. 21, 1987, 8706781

Int. Cl.[4] H04D 1/06

U.S. Cl. 367—136 20 Claims



1. Apparatus for providing a plurality of acoustic power spectra, all defined over a predetermined frequency band from acoustic signals received in a predetermined time interval, for individually identifiable directions, comprising

(i) an array of microphone elements fixedly disposed in relation to each other substantially in a measurement plane,

(ii) sampling means operable to define a succession of sampling periods throughout the predetermined time interval and for each sampling period to sample the acoustic signals received by the array elements,

(iii) array sample storage means having readable storage locations operable to store for each array element each signal sample and the samples of a plurality of immediately preceding sampling periods,

(iv) directed beam forming means operable to define for each beam direction relative delays between array element signals characteristic of the reception beam direction in terms of the sampling period and storage locations at which the samples have been stored with the appropriate delays and for at least some of the sampling periods read the stored samples at locations corresponding to the relative delays associated with the beam directions and combine the read samples to give directed beam samples associated with the individual sampling periods for each of the beam directions,

(v) directed beam sample storage means operable to store directed beam samples to form, for each beam direction, for sampling periods extending over at least a part of the predetermined interval a set of directed beam samples, and

(vi) analysis means operable at the end of the predetermined interval to determine from each set of directed beam samples the acoustic power spectrum of the signals received from the direction associated with the set.

4,893,290

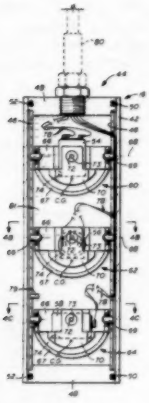
THREE-AXIS SENSOR

William O. McNeel; James A. Sackett; Joe N. Wood, all of Houston, and Julian Soliz, III, Pearland, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation of Ser. No. 924,679, Oct. 29, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 260,693

Int. Cl.[4] G01V *1/00*

U.S. Cl. 367—178 **20 Claims**



1. An apparatus for detecting seismic signals along orthogonal axes, consisting essentially of:

(a) a housing having a longitudinal axis;

(b) at least two gimbals located within the housing, the gimbals providing two degrees of rotational freedom perpendicular to the longitudinal axis of the housing, each gimbal having an outer table pivotally coupled to the housing perpendicular to the longitudinal axis thereof to define a first pivot axis, and an inner table pivotally coupled to the outer table at a right angle to the first pivot axis to define a second pivot axis, the first pivot axis of each gimbal is contained in a common plane passing through the housing and contains the longitudinal axis of the housing; and

(c) at least two seismic sensors disposed within the housing, each having an axis of sensitivity to the seismic signals and each suspended within the housing by one of said gimbal, the sensors oriented such that their axes of sensitivity are orthogonal to each other, and remain orthogonal with the longitudinal axis of the housing inclined from a horizontal.

4,893,291

DEVICES FOR AIDING RESYNCHRONIZATION OF BODY CLOCKS

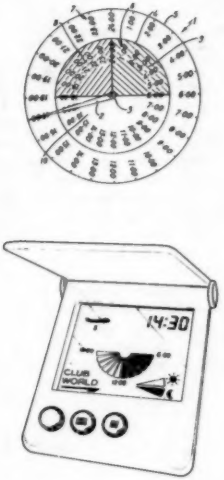
Peter A. Bick, Fife, and Christine J. Kinnell, Edinburgh, both of Scotland, assignors to Jet-R Limited, Edinburgh, Scotland

Filed Aug. 26, 1988, Ser. No. 236,970

Claims priority, application United Kingdom, Aug. 29, 1987, 8720477

Int. Cl.[4] G04B *47/00, 19/22*

U.S. Cl. 368—10 **15 Claims**



1. A device for aiding resynchronisation of a personal body clock of a traveller, said device comprising a first data series representing the personal body time of the traveller and a second data series representing local time at the destination of the traveller, both said data series having representations of twenty-four hours and being displaceable with respect to each other, the mutual displacement of the data series being carried out with reference to the time of the departure of the traveller and the duration of the journey of the traveller, a readable display for indicating a procedure to resynchronise the personal body clock of the traveller upon said mutual displacement, said procedure comprising controlling exposure of the body of the traveller to daylight.

4,893,292

ELECTRONIC WATCH MOVEMENT COMPRISING TIME DISPLAY MEANS HAVING INDICATOR HANDS

Willy Cleusix, Le Landeron, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

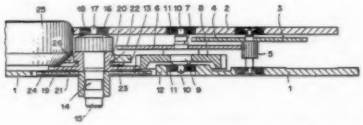
PCT No. PCT/CH87/00094, § 371 Date Apr. 6, 1988, § 102(e) Date Apr. 6, 1988, PCT Pub. No. WO88/01071, PCT Pub. Date Feb. 11, 1988

PCT Filed Aug. 3, 1987, Ser. No. 181,294

Claims priority, application Switzerland, Aug. 7, 1986, 03176/86

Int. Cl.[4] G04B *37/00, 19/02*

U.S. Cl. 368—88 13 Claims



1. An electronic watch movement comprising a bottom-plate having a central opening, a cell, time display means having indicator hands, a motor and a gear-train connecting the motor to the indicator hands, said gear-train including an intermediate gear, a center gear having a shaft and having a wheel and a pinion solid with said shaft, a minutes gear and an hours wheel, having a pipe, rotatably mounted on said shaft directly over the wheel of said center gear, the wheel of said center gear meshing with teeth on said intermediate gear and extending over said cell, and the central opening in said bottom-plate having a diameter larger than that of the pinion of said center gear.

4,893,293

METHOD FOR OPERATING MULTIDISK PLAYER

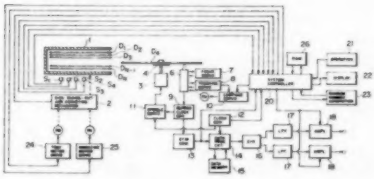
Fumio Endo; Toshiyuki Kimura, and Yoshio Aoyagi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 164,027, Mar. 4, 1988, abandoned. This application Dec. 21, 1988, Ser. No. 296,386

Claims priority, application Japan, Mar. 4, 1987, 62-47788; Mar. 4, 1987, 62-47789; Mar. 4, 1987, 62-47792

Int. Cl.[4] G11B *17/22*

U.S. Cl. 369—34 2 Claims



1. A method for detecting the presence or absence of a disk in at least one of plural trays in a magazine set into a disk player, comprising the steps of:

detecting when said magazine has been set in said disk player;

conveying said trays one at a time from said magazine to a playing position in response to detection of said magazine in said detection step;

detecting for each tray thus conveyed whether or not a disk is on said tray; and

ejecting said magazine when no disk is detected.

4,893,294

DISK PLAYER AND DISK PLAYING METHOD IN WHICH TRACKING MISS TOLERANCE IS ADJUSTED

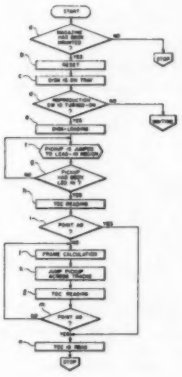
Toshiyuki Kimura; Yoshio Aoyagi, and Fumio Endo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 164,353, Mar. 4, 1988. This application Oct. 5, 1988, Ser. No. 253,473

Claims priority, application Japan, Mar. 4, 1987, 62-47790; Mar. 4, 1987, 62-47791; Mar. 4, 1987, 62-47793; Mar. 4, 1987, 62-47794

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 12 Claims



1. A disk playing method for a disk player, comprising the steps of:

detecting a tracking miss that is not within a predetermined tolerance; and

varying said predetermined tolerance in an amount corresponding to a difference between an address actually read and an expected address used in said tracking miss detection according to a frequency of occurrence of said tracking miss.

4,893,295

FRONT LOADING DISK PLAYER

Ryo Matsuura; Nobuyuki Isobe, and Masao Kase, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 60,699, Jun. 11, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 284,836

Claims priority, application Japan, Jun. 11, 1986, 61-135241; Jun. 11, 1986, 61-135242

Int. Cl.[4] G11B *17/04, 25/04*

U.S. Cl. 369—75.2 7 Claims

1. A front loading disc player, comprising:

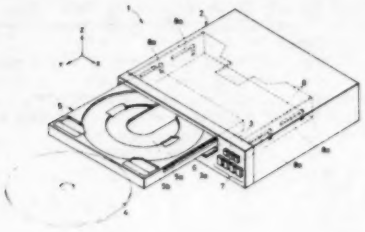
a housing;

play means including a turntable;

a carrier for carrying a disc to be played; and

projection/accommodation means for moving said carrier so as to project/accommodate said carrier out-of/into said housing, said projection/accommodation means including moving members movably provided within said housing, means for applying a driving force to said moving members, and carrier moving means for moving said carrier in a horizontal direction and a vertical direction in response to the movement of said moving members in a horizontal direction, said carrier moving means including a speed multiplier mechanism for moving said carrier at a higher rate of speed than that of said moving members as said

moving members move in a horizontal direction, said speed multiplier mechanism being connected with said



carrier in the middle of the movement of said moving members in the horizontal direction.

4,893,296

OPTICAL PICKUP DEVICE

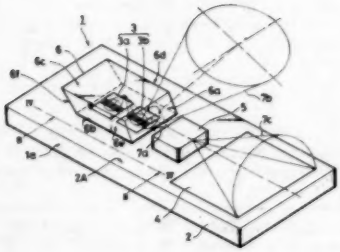
Yoshiyuki Matsumoto; Hidehiro Kume; Koji Mitsumori; You Yoshitoshi, all of Tokyo; Etsufumi Yamamoto, Kanagawa, and Hiroshi Oinoue, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,915

Claims priority, application Japan, Jul. 30, 1987, 62-190788

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—112 **14 Claims**



1. An optical pickup device comprising:

(a) a substrate;

(b) a semiconductor laser element mounted on said substrate;

(c) a photo detector for receiving a laser beam emitted from said semiconductor laser element formed on said substrate;

(d) an optical path branching optical element fixed to said substrate on said photo detector and of which the face opposing said semiconductor laser element is formed as an inclined face on which is deposited a semitransparent reflection film; and

(e) preventing means provided on said optical element for preventing, of laser beams incident on said optical element, reflected and/or scattered laser beams within said optical element from being introduced into said photo detector.

4,893,297

DISC-SHAPED MEMBER

David P. Gregg, Culver City, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 812,158, Jul. 1, 1977, Pat. No. 4,819,223, Continuation of Ser. No. 571,259, Apr. 24, 1975, abandoned, Continuation of Ser. No. 735,007, Jun. 6, 1968, abandoned. This application Mar. 8, 1989, Ser. No. 320,534

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—275 **17 Claims**

1. A disc-shaped member, comprising:

a major surface having a planar surface area and a plurality of spaced-apart, elongated, discrete surface indicia integral with said planar surface area and extending away from the plane of said planar surface area, wherein:

said discrete surface indicia are sequentially arranged in a plurality of substantially parallel information tracks;

adjacent surface indicia along each track are separated by interval portions of said planar surface area;

said parallel information tracks are separated by intertrack portions of said planar surface area;

said intertrack portions and said interval portions together define said planar surface area;

said discrete surface indicia have substantially uniform widths defining the width of said information tracks;

said intertrack portions between adjacent information tracks have substantially uniform widths; and

said discrete surface indicia have variable lengths to represent stored information.

4,893,298

RECORD-CARRIER BODY PROVIDED WITH A RELIEF STRUCTURE OF OPTICALLY DETECTABLE SERVO-TRACK PORTIONS AND SECTOR ADDRESSES AND APPARATUS FOR FORMING SAID STRUCTURE

Johannes H. T. Pasman, and Nicolaas C. J. A. Van Hijningen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1985, Ser. No. 735,005

Claims priority, application Netherlands, Jan. 22, 1985, 8500153

Int. Cl.[4] G11B *7/24, 7/26*

U.S. Cl. 369—275 **7 Claims**

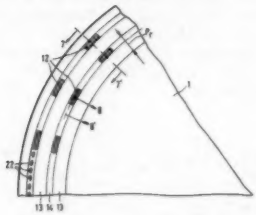
1. A record-carrier body for recording information thereon with a write beam of radiation, said record carrier body comprising:

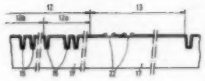
a planar substrate provided with a plurality of elongated, generally parallel servo tracks which are separated from each other in a direction normal to the longitudinal direction thereof by lands extending there-between, said lands having a flat surface which is coplanar with the surface of said substrate;

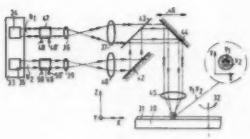
a recording layer disposed on said surface of said lands, said recording layer being modifiable by the write beam incident thereon so as to enable information to be recorded on said lands;

said lands having sector addresses spaced along the length thereof so as to define segments therebetween, each sector address being associated with a respective adjacent segment and containing an address of that segment, each sector address being comprised of first areas which are detectable by a beam of radiation, which first areas are

spaced from each other in the longitudinal track direction by intermediate areas and which first areas have a first phase depth; said servo tracks having a second phase depth which is different from said first phase depth and being adapted to be scanned by a beam of radiation so as to derive therefrom a signal for correcting the position of







the write beam during recording of information on said lands; and

said servo tracks having a maximum width transverse to the longitudinal track direction which is at least 60% of the track period, such maximum width also being at least twice the maximum width of said first areas transverse to the longitudinal track direction.

4,893,299

MAGNETO-OPTIC DATA STORAGE TECHNIQUE

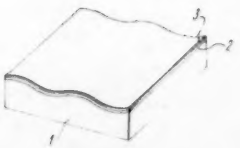
Victor C. Humberstone, 22, Greenfield Close, Stapleford, Cambridgeshire, United Kingdom CB3 6RP; Robert M. Pettigrew, Pound Cottage, High Street, Foxton, Cambridgeshire, United Kingdom CB2 6RP, and Peter R. Helfet, 5 Meadow Drive, London, United Kingdom (NW4 1SD)

Filed Dec. 28, 1984, Ser. No. 688,915

Claims priority, application United Kingdom, Apr. 28, 1983, 8311691; Nov. 9, 1983, 8329859

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—275 **7 Claims**



1. An optical data storage medium for use in an optical read/write system using an optical read radiation of wavelength W, comprising:

a medium including a region which carries a surface texture including raised areas and depressed areas which are disposed in a regular array with a period (pitch) measured transversely to the mean surface level of not greater than W and a depth (peak-to-trough) in the range 10 to 1,000 nanometers, and wherein the medium comprises (a) a substrate, and (b) a regular array of zones of a magneto-optic material disposed at least over the peaks and troughs of said surface texture and conforming thereto; and

the texture of the surface being in the form of a series of alternate grooves and ridges which are substantially parallel and are in the form of concentric rings or concentric spirals.

4,893,300

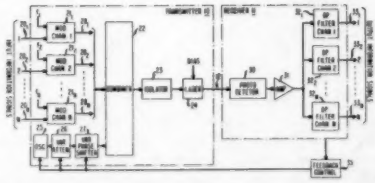
TECHNIQUE FOR REDUCING DISTORTION CHARACTERISTICS IN FIBER-OPTIC LINKS

James W. Carlin, Holmdel; Anthony C. Chipaloski, Howell, and Robert P. Schloss, East Brunswick, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 1, 1988, Ser. No. 226,697

Int. Cl.[4] H04B 9/00

U.S. Cl. 370—3 **10 Claims**



1. A lightwave transmitter for suppressing intermodulation products in a lightwave frequency division multiplexed (FDM) transmitter output signal, the transmitter comprising:

means for receiving an electrical FDM information signal comprising a plurality of N channel information signals disposed in separate non-overlapping portions of a predetermined FDM channel frequency band;

means for providing an electrical intermodulation product suppression signal comprising a tone which is (1) at a predetermined power level above the power level of the channel information signals in the electrical FDM information signal, and (2) disposed outside of the predetermined FDM channel frequency band at a frequency that causes minimal intermodulation products to be formed within the predetermined FDM channel frequency band;

combining means for combining (1) the electrical FDM information signal from the receiving means, and (2) the electrical intermodulation suppression signal from the providing means to generate a combined resultant FDM output signal; and

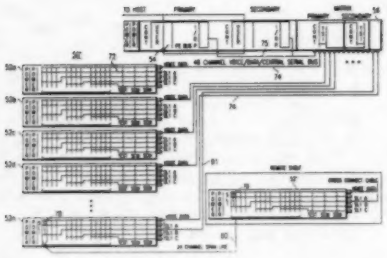
means for generating a predetermined lightwave carrier, the generating means being responsive to the combined resultant FDM output signal from the combining means for intensity modulating the lightwave carrier to generate the lightwave FDM transmitter output signal.

4,893,301

AUTOMATIC CALL DISTRIBUTION (ACD) SWITCHING SYSTEM HAVING DISTRIBUTED PROCESSING CAPABILITY

Gerald W. Andrews, Colleyville; William E. Dunnigan, Garland; E. Fletcher Haselton, Irving, and William J. Redwood, Coppell, all of Tex., assignors to Teknekron Infoswitch Corporation, Fort Worth, Tex.

Continuation-in-part of Ser. No. 211,589, Jun. 27, 1988, Pat. No. 4,840,570. This application Jul. 29, 1988, Ser. No. 226,229
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58.2 18 Claims



1. An automatic call distribution (ACD) switching system having a switch control module for controlling a timeslot interchange switch to selectively connect one of a plurality of telephone trunks to one of a plurality of agent workstations, comprising:

a plurality of agent/trunk interface circuits for interfacing the telephone trunks to the agent workstations;

a backplane having a timeslot serial bus connected to the timeslot interchange switch, and a non-timeslot serial bus;

a first line interface module (LIM) supported on the backplane and having a shelf control module (SCM) and a plurality of carrier cards connected to the timeslot serial bus and the non-timeslot serial bus, the carrier cards having means for supporting one or more of the agent/trunk interface circuits;

control means supported on each carrier card an responsive to a call processing request for service at a first agent/trunk interface circuit on the carrier card for generating a data packet and transmitting the data packet over the non-timeslot serial bus to the shelf control module, the call processing request for service requiring the first agent/trunk interface circuit be connected to a second agent/trunk interface circuit; and

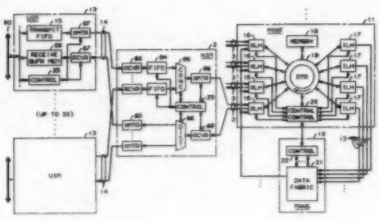
control means supported on the shelf control module for receiving the data packet from the carrier card and in response thereto transmitting control information to the switch control module to enable the switch control module to direct the timeslot interchange to establish a connection between the first agent/trunk interface circuit and the second agent/trunk interface circuit.

4,893,302

ARRANGEMENT FOR SWITCHING CONCENTRATED TELECOMMUNICATIONS PACKET TRAFFIC

Jayant G. Hemmady, Naperville; Michael J. Knudsen, Wheaton; William P. Lidinsky, Naperville; Robert K. Nichols, Glen Ellyn; Gaylord W. Richards, Naperville; Gary A. Roediger, Downers Grove; Scott B. Steele, Naperville; Ronald C. Weddige, Western Springs, and Bruce R. Zelle, Naperville, all of Ill., assignors to Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,698
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 7 Claims



1. A data distribution means for switching data packets from a plurality of inputs to a plurality of outputs connectable to another switching network, comprising:

memory control means for concurrently loading data from each of said plurality of inputs to a memory and unloading data from said memory to each of said plurality of outputs; and

processing means;

wherein said memory control means loads said memory in parallel from said plurality of inputs and unloads said memory in parallel to said plurality of outputs;

wherein said processing means comprises means for controlling said memory control means for chaining groups of data packets addressed to a common output of said another switching network; and

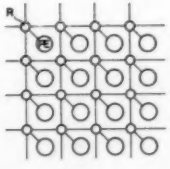
wherein said processing means comprises means for controlling said memory control means for unloading of each of said groups of chained data packets in one sequence from said memory to one of said plurality of outputs.

4,893,303

METHOD AND APPARATUS FOR PARALLEL COMPUTATION

Sadao Nakamura, Yamato, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 2, 1988, Ser. No. 266,152
Claims priority, application Japan, Nov. 11, 1987, 62-284747
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 8 Claims



1. An apparatus for parallel computation which processes information represented in forms of message packets, a first of

which contains an address of an ultimate destination of a message while the remaining of which do not contain said address,

said apparatus comprising a multiplicity of processing units interconnected together, each of said processing units comprising:

processing element means for processing information; and

router means for controlling transfer of said message packets in and out of said processing element means,

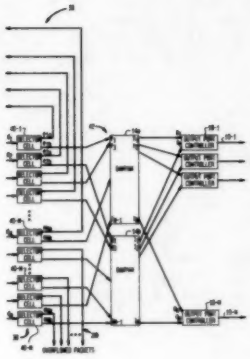
said router means including:

means for deciding a route in which a first outgoing message packet of said message is to be transferred from said router means to another router means in accordance with the ultimate destination of said message and the operational conditions of neighboring router means;

routing table means for recording said route decided by said deciding means; and

means for transferring all said message packets of said message in accordance with said route recorded in said routing table means.

rality of routing paths to each of said plurality of outputs, and



a selector network for applying said identified recirculating packets to said recirculation loops and said identified exiting packets to said routing networks.

4,893,304

BROADBAND PACKET SWITCH WITH COMBINED QUEUING

James N. Giacopelli, Flanders, N.J., and Morgan Littlewood, Middle Park, Australia, assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 2, 1988, Ser. No. 240,748

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **20 Claims**

1. A packet switch comprising:

a plurality of inputs and a plurality of outputs,

a sorting network connected to said inputs for sorting data packets to be routed through said switch,

a trap network connected to said sorting network for identifying said data packets as exiting packets or recirculating packets,

a plurality of recirculation loops connected to at least some of said inputs,

a plurality of distinct routing networks for providing a plu-

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4,893,305

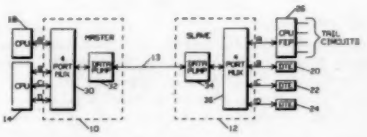
INBAND DYNAMIC PORT ALLOCATION

Raul F. Fernandez, Miami, and Ignacio Urbieta, Jr., Miami Lakes, both of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Mar. 31, 1988, Ser. No. 175,871

Int. Cl.[4] H04J *3/22*; H04B *1/38*; H04L *5/16*

U.S. Cl. 370—84 **20 Claims**



1. In a multi-port modem, a method of allocating bandwidth from a donor port which is idle to a recipient port which is to have its bandwidth allocation increased without interrupting other ports in said modem, said multi-port modem being of the kind that transmits and receives data to and from a plurality of

ports including said donor and recipient ports over a transmission medium using time division multiplexing so that each port uses one or more time slots for data transmission, and wherein the data are transmitted over said transmission medium, the method comprising the steps of:

transmitting a code over said donor port time slot to signify that said donor port is idle;

coordinating a change in transmission rate of said recipient port by transmitting a handshaking protocol over the time slots of said idle donor port and said recipient port; and

reconfiguring said multi-port modem to allocate the bandwidth of said donor port to said recipient port without interruption of said other ports.

4,893,306

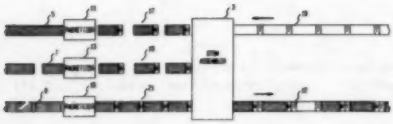
METHOD AND APPARATUS FOR MULTIPLEXING CIRCUIT AND PACKET TRAFFIC

Hung-Hsiang J. Chao, Madison; Sang H. Lee, Bridgewater, and Liang T. Wu, Gladstone, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 10, 1987, Ser. No. 118,977

Int. Cl.[4] H04J *3/16, 3/26*

U.S. Cl. 370—94.2 **7 Claims**



1. A method for simultaneously transmitting data from sources having different bit rates in a telecommunication network comprising the steps of:

generating a bit stream comprising a sequence of frames, each of said frames including a transmission overhead field containing frame timing information and an empty payload field, and

filling the empty payload fields in said frames with data in packetized format from a plurality of sources which have access to the bit stream including circuit or packet sources, such that data in packetized format from any of said sources is written into any available empty payload field of any of said frames for transmitting data from each of said sources at its own desired bit rate via said bit stream and for transmitting data from said plurality of sources simultaneously via said bit stream.

4,893,307

METHOD AND APPARATUS FOR LINKING SNA TERMINALS TO AN SNA HOST OVER A PACKET SWITCHED COMMUNICATIONS NETWORK

Douglas B. McKay, Potomac; Richard M. Morten, Gaithersburg, and Michael P. Marsili, Middletown, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,545

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—94.1 **25 Claims**

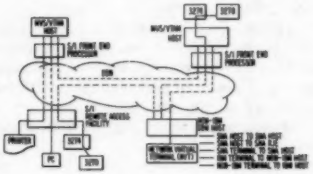
1. A data communications system for establishing a communications path from an SNA host computer over a packet switched network to an SNA terminal, comprising:

a front end processor having a first SNA interface means coupled to said SNA host and having a first packet switched interface coupled to said packet switched network, for transferring data and control messages between said host with an SNA protocol and said packet switched network with a packet switched protocol;

a remote access facility having a second SNA interface means coupled to said SNA terminal and a second packet switched interface coupled to said packet switched network; for transferring said data and control messages between said terminal with said SNA protocol and said packet switched network with said packet switched protocol;

said front end processor further comprising:

a plurality of SNA PU2 channel interfaces coupled to said SNA host;



means for dynamically allocating to one of said plurality of PU2 channel interfaces, a SNA logical unit from a pool of a plurality of available SNA logical units in response to said remote access facility requesting over said packet switched network, that a communications path be established with said SNA host.

4,893,308

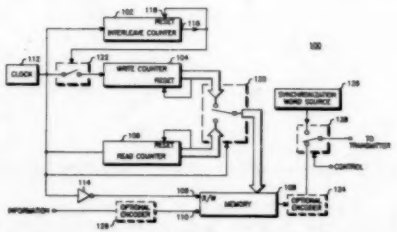
METHOD AND APPARATUS FOR TIME COMPANDING A DIGITAL VOICE SIGNAL

Alan L. Wilson, Hoffman Estates; Michael W. Bright, Arlington Heights; Michelle M. Bray; Eric F. Ziolko, both of Schaumburg, and David L. Weiss, Roselle, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1986, Ser. No. 903,315

Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—109 **22 Claims**



1. A method of expanding a compressed digital information signal having at least every Nth information bit removed and any remaining information bits contiguously arranged to form said compressed digital signal, said method comprising the steps of:

(a) receiving the compressed information signal to provide a received signal;

(b) predicting at least every Nth information bit from said received signal to provide predicted information bits, and expanding said received signal such that said predicted information bits may be interleaved therewith to provide a recovered signal.

4,893,309

DIGITAL INTERFACE BETWEEN AT LEAST TWO SUBSCRIBER LINE INTERFACE CIRCUITS AND A PROCESSING UNIT

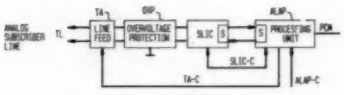
Robert Lechner, Sankt Poelten, Austria; Hans-Werner Rudolf, Munich, Fed. Rep. of Germany; Harald Stader, Munich, Fed. Rep. of Germany; Norbert Wingerath, Munich, Fed. Rep. of Germany; Christopher C. A. Priest, Maidenhead, United Kingdom; Nigel P. Dyer, London, United Kingdom; Robert K. P. Galpin, Knutsford, United Kingdom; Marcello Manca, Milan, Italy; Virgilio Mosca, Milan, Italy; Antonio Nicastro, Milan, Italy; Pierre Albouy; Robert Le Gougnec, both of Lannion, France, and Ramatchandirane Nadaradjane, Perros-Guirec, France, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,428

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704409

Int. Cl.[4] H04J *3/12*

U.S. Cl. 370—110.1 3 Claims



1. A digital interface circuit between at least two subscriber interface circuits over which analog subscriber lines are connected to a time multiplex switching center of a digital time-multiplexed telecommunications network, and a processing unit of the time multiplex switching center performing the coding and decoding and filtering of the telephone data transmitted over the subscriber lines under the control of its own processor, which also transmits instructions to set up the various operating conditions of the subscriber line interface circuits and instructions for determining the type of subscriber line status indications for which the subscriber lines must be interrogated, comprising:

it is designed as a parallel interface;

the processing unit has a plurality of connections to which connections are selectively allocated a level of an input-/output register in which the data being received from or to be sent to, the subscriber line interface circuits and thus the subscriber lines connected to the same, are temporarily stored pending the arrival of a read or write instruction, as well as a level of a control register;

means are provided for selectively activating the connections of the processing unit as signal inputs or signal outputs depending upon which of two possible switching states the respective level of the control register is placed in;

means are provided for bringing the connections of the processing unit into a first operating mode, in which these connections serve to link up with connections of subscriber lines that also have an input/output register whose levels are allocated to some of the connections of these subscriber line units; and

means for operating the connections of the processing unit in a second operating mode, in which they can be linked up with connections of subscriber line units that have no such input/output register.

4,893,310

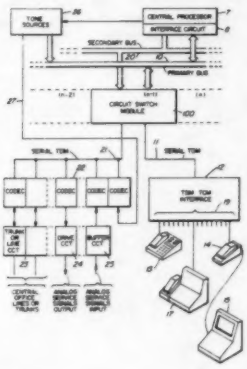
DIGITAL KEY TELEPHONE SYSTEM

David J. Robertson, Ottawa, Canada; Ronald J. Maginley, Ann Arbor, Mich.; Alan S. J. Chapman, Kanata, Canada; Terence N. Thomas, Nepean, Canada; Nadir Nizamuddin, Kanata, Canada; John W. J. Williams, Kanata, Canada; Alan M. Redmond, Kanata, Canada, and Robert S. Morley, Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 126,710, Nov. 30, 1987. This application Mar. 10, 1988, Ser. No. 166,345

Int. Cl.[4] H04J *3/12;* H04Q *11/04*

U.S. Cl. 370—110.1 16 Claims



1. A key telephone system for providing digital signal communication paths between a plurality of ports and for providing a signaling and supervision link between, any of said ports and a processing device in the key telephone system, comprising:

a communication path being operable to provide n pairs of time division multiplex transmit (TDMT) and time division multiplex receive (TDMR) channels, each channel including a plurality of bit positions, at least one of said n pairs of TDMT and TDMR channels being exclusively associated with each port of said plurality of ports and each said TDMT channel and said TDMR channel including a signaling and supervision (S and S) bit position in said plurality of bit positions;

a switching means being operable to couple communication signals between bit positions of selected ones of the TDMT channels and bit positions of selected ones of the TDMR channels, to the exclusion of said S and S bit positions, as directed by the processing device;

an interface means for transferring information from the S and S bit position of a selected TDMT channel to the processing device and for transferring information from the processing device to the S and S bit position of at least one of the TDMR channels.

4,893,311

CMOS IMPLEMENTATION OF A BUILT-IN SELF TEST INPUT GENERATOR (BISTIG)

Craig C. Hunter, Vancouver, Wash., and Thomas S. Spohrer, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 25, 1988, Ser. No. 185,610

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—22.5 3 Claims

1. In a built in self test input generator (BISTIG) for a programmable logic array (PLA), wherein the PLA comprises a first level array adapted to receive N input signals in N input lines and to provide M product terms on M product term lines, and a second level array adapted to receive the M product

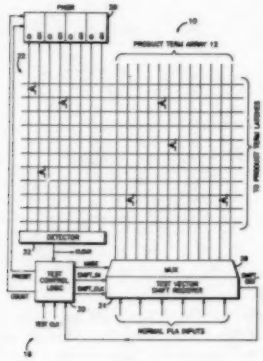
terms on the M product term lines and to provide P output signals on P output lines, wherein N, M, and P are integers greater than one, the BISTIG having a product term selector which sequentially enables each of the M product term lines of the second level array individually in response to a first control signal, an improved test vector generator comprising:

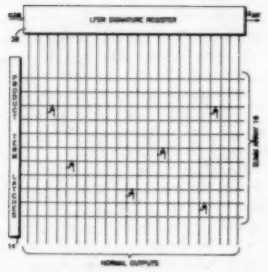
initialization means for selectively generating an initial N-bit vector comprising N-1 logical zeroes and a single logical one in response to a second control signal;

N-stage, recirculating shift register means, coupled to said initialization means, for selectively generating one of N test vectors by sequentially shifting each of said N-bits comprising said initial vector by one bit in response to a third control signal;

coupling means, coupled to said shift register means and to said N input lines of said PLA, for selectively coupling each of said N-bits comprising said one test vector to a corresponding one of said N input lines in response to a fourth control signal, thereby allowing said single logical one to be shifted across a true and a complement of said N input lines; and

control means, coupled to said product term selector, to said initialization means, to said shift register means and to said coupling means, for receiving a test signal and each of a plurality of clock pulses, and selectively providing said first control signal each time said shift register means recirculates said logical one, thereby incrementing a product term address provided by said product term selector, and selectively providing said second control signal in response to first receiving said test signal, thereby initializing said product term selector to an initial value, and selectively providing said third control signal in response to receiving each clock pulse, thereby shifting said single logical one into one of said N-stages of said shift registers means, and providing said fourth control signal substantially continuously while receiving said test signal.





4,893,312

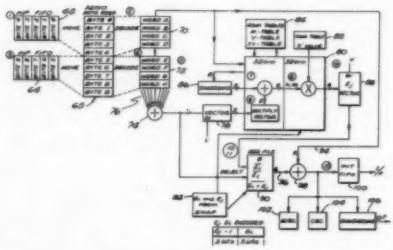
COMPACT, REAL TIME TAPE DRIVE SYSTEM

John R. Cogley, Jr., Covina, Calif., assignor to Qualstar Corporation, Chatsworth, Calif.

Filed Apr. 25, 1988, Ser. No. 185,793

Int. Cl.[4] G11B *20/18*

U.S. Cl. 371—37.8 **20 Claims**



1. An error detection and correction system for nine track tape recorders comprising:

means for receiving successive bytes of digital information each including eight bits;

means for calculating a parity correction bit for each said byte of data and adding it to said eight bits to form a series of nine bit bytes of binary information;

a microcomputer;

means for forming a cyclic redundancy code for a block of data bytes, in the form of an error correction check byte, by offsetting successive bytes in said block of data bytes by one bit, and adding the digital data, to obtain a product high and a product low, using the address indicated by the product high as a pointer to retrieve a Modifier from a stored table associated with the microcomputer, and adding the modifier to the product low to form an error correction check (ECC) byte;

means for recording the block of data bytes along with the ECC byte on a nine track tape;

means for retrieving the block of data and ECC byte from the tape;

means for calculating a parity check error vector by checking the parity of each byte in the block of data and the ECC byte;

means for calculating the error syndrome by repeating the steps for forming the ECC byte, but including the ECC byte;

means for identifying two of the nine columns or tracks Ei and Ej which most probably contain errors;

means for calculating the error correction vectors for each of columns Ei and Ej, using the error vector, the error syndrome, an identification of the two channels Ei and Ej, and Look-Up Tables stored in memory associated with said microcomputer; and

means for supplying the disrupted data to an error correction circuit concurrently with data representing the error correction vectors, to correct the disrupted data to its input format.

4,893,313
SEMICONDUCTOR LASER DEVICE WHICH HAS A DOUBLE-HETERO STRUCTURE HAVING AN OPTIMAL LAYER THICKNESS

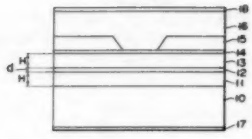
Genichi Hatakoshi, Yokohama; Kazuhiko Itaya, Tokyo; Shigeya Naritsuka, Yokohama; Masayuki Ishikawa, Nishimine; Hajime Okuda, Yokohama; Hideo Shiozawa, Yokohama; Yukio Watanabe, Yokohama; Yasuo Ohba, Yokohama; Yoshihiro Kokubun, Yokohama, and Yutaka Uematsu, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1989, Ser. No. 323,400

Claims priority, application Japan, Mar. 14, 1988, 63-59908; May 13, 1988, 63-114747; May 13, 1988, 63-114750; May 13, 1988, 63-114751

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **23 Claims**



1. A semiconductor laser device for emitting a laser beam having a wavelength λ, comprising:

a double-hetero structure including:

an active layer made of $In(Ga_{1-y}Alpgd\ y)P$ and having a thickness d and a refractive index n_a, and first and second surfaces;

a first cladding layer of a first conductivity type formed on the first surface of the active layer having a refractive index n_c, made of $In(Ga_{1-x}Al_x)P$, where x and y satisfy the inequality of $0 \leqq y < x \leqq 1$; and

a second cladding layer of a second conductivity type formed on the second surface of the active layer, having a refractive index nc_2, and made of $In(Ga_{1-z}Al_z)P$, where y and z satisfy the inequality of $0 \leqq y < z \leqq 1$, wherein said double-hetero structure satisfies the following ineguality:

$$0.015\Delta^{-1} < d/\lambda < 0.028\Delta^{-1}$$

where is specific refractive index difference defined as:

$$\Delta = (\Delta_1 + \Delta_2)/2$$

$$\Delta_1 = (na^2 - nc_2)/(2n_a^2)$$

and

$$\Delta_2 = (na^2 - nc_2^2)/(2n_a^2)$$

4,893,314
PROTECTED INTERNAL LASER MIRROR ADJUSTING APPARATUS

William Shull, Aptos; Rudolf Nissen, Pescadero, and Kim M. Gunther, Watsonville, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

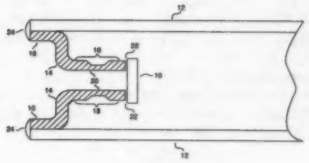
Filed Sep. 29, 1988, Ser. No. 251,120

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—107 **4 Claims**

1. A protected internal laser mirror adjustment apparatus, insertable into a laser tube, including:

a hollow mirror seat completely insertable into the end of a laser tube, said mirror seat having a first portion of a first length and a first outside diameter closely matched with the inside diameter of said laser tube, and having a second portion of a second length and a second outside diameter smaller than said first outside diameter for attachment of a mirror,



means in said second length, for facilitating the deformation of at least the portion of said second length of said mirror seat to which said mirror is attached, thereby adjusting said mirror off of its normal axis.

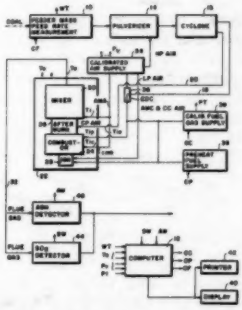
4,893,315
CALORIMETRY SYSTEM

John C. Homer, Chardon; Shahriar Nowshiravani, Mayfield Hts.; Steven L. Ross, Cleveland, and Gilbert F. Lutz, Chesterland, all of Ohio, assignors to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 153,741, Feb. 8, 1988, Pat. No. 4,846,081, which is a continuation of Ser. No. 36,048, Apr. 8, 1987, Pat. No. 4,809,190. This application May 8, 1989, Ser. No. 348,918

Int. Cl.[4] G01N *25/38*

U.S. Cl. 374—37 **8 Claims**



3. A calorimetry system for measuring the heating value of solid fuel, such as coal, which comprises a calorimeter having a combustor which converts the fuel into combustion gases and a mixer which mixes the combustion gases with another gas to provide flue gas, means for the continuous measurement of the feed rates of the fuel and gases which flow into said calorimeter and the temperature of the gases which flow into said calorimeter and the temperature of the flue gas, means for supplying fuel gas of known heating value to said calorimeter, means utilizing said measurement means for calibrating said calorimeter while said fuel gas of known heating value is being supplied, means for supplying said solid fuel to said calorimeter while measuring the mass feed rate thereof, means responsive to said continuous measurement of said mass feed rates of said solid fuel and gases into said calorimeter and the temperature of said gases and said flue gases to analyze the heating value of said solid fuel.

4,893,316

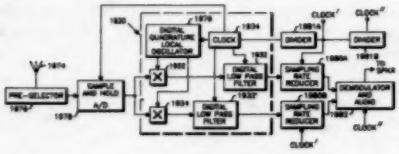
DIGITAL RADIO FREQUENCY RECEIVER

Robert V. Janc, Palos Heights; Steven C. Jasper, Hoffman Estates; Lester A. Longley; Katherine L. Zehrose, both of Chicago; William J. Turney, and Ross J. Lillie, both of Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 771,736, Sep. 3, 1985, abandoned, Continuation-in-part of Ser. No. 720,311, Apr. 4, 1985, abandoned, Continuation-in-part of Ser. No. 612,107, Apr. 20, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 890,804

Int. Cl.[4] H04L *27/18*

U.S. Cl. 375—44 **162 Claims**



1. An apparatus for extending the threshold sensitivity of an analog to digital (A/D) converter that converts an analog alternating current (AC) input signal having a given frequency into digital data, comprising:

means for generating a noise signal which does not have any substantial energy at said given frequency;

means for summing said analog AC input signal and said noise signal to produce a resultant signal that is coupled to an input of the A/D converter;

clock means for generating periodic pulses at a first frequency coupled to said A/D converter causing the latter to make A/D conversions in response to said pulses; and

the resultant signal produced by said summing means containing the signal component corresponding to said analog AC input signal which is converted by the A/D converter into a digital data representation, said A/D converter having a given threshold sensitivity and the magnitude of said AC input signal being less than said threshold sensitivity, said signal component corresponding to the AC input signal being converted by the A/D into digital data, whereby AC input signals having a magnitude less than said given threshold sensitivity of the A/D converter can be converted into digital data thereby extending the threshold sensitivity of the A/D converter.

4,893,317

DIGITAL SIGNALS AND FREQUENCY CORRECTION IN A DIGITAL WIRELESS SYSTEM

David N. Critchlow; Graham M. Avis; Sandra J. Earlam, all of San Diego; Karle J. Johnson, Carlsbad; Bruce A. Smetana, Escondido; Gregory L. Westling, Poway, all of Calif.; Eric Paneth, Givatalim, Israel, and Moshe Yehushua, San Diego, Calif., assignors to International Mobile Machines Corporation, Philadelphia, Pa.

Division of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448. This application Oct. 12, 1988, Ser. No. 256,415

Int. Cl.[4] H04L *27/06*

U.S. Cl. 375—97 **1 Claim**

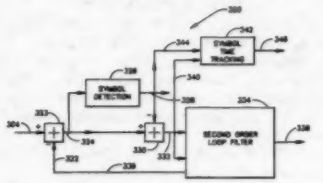
1. A symbol time tracking and Automatic Frequency Control (AFC) system comprising

an input for a detected phase signal;

means for subtracting a phase correction value from the detected phase signal to provide a corrected phase signal;

means for quantizing the phase of the corrected phase signal to a predetermined increment;

means for subtracting the quantized phase signal from the corrected phase signal to provide a phase error signal; and



means for obtaining said phase error signal and computing both said phase correction value and a frequency correction signal therefrom.

4,893,318

METHOD FOR REFERENCING MULTIPLE DATA PROCESSORS TO A COMMON TIME REFERENCE

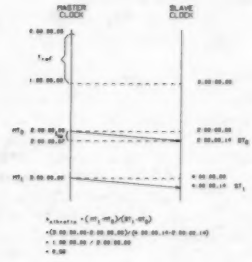
Richard J. Potash, Dedham, Mass., and Steven K. Burns, Durham, N.H., assignors to Computer Sports Medicine, Inc., Waltham, Mass.

Filed Jan. 26, 1988, Ser. No. 148,565

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[4] H04L *7/00*

U.S. Cl. 375—109 **43 Claims**



1. A method for referencing at least one slave clock to a master clock, said master clock providing a master clock time signal, said slave clock providing a periodically incremented slave clock time signal, said method comprising the steps of:

(1) transmitting from said slave clock to said master clock a first time signal having a value ST_0 corresponding to the value of said slave clock time signal when said first time signal is transmitted;

(2) determining a value MT_0 of said master clock time signal when said first time signal is received by said master clock;

(3) subsequently transmitting from said master clock to said slave clock a second time signal having the value MT_0;

(4) subsequently transmitting from said master clock to said slave clock a third time signal having a value MT_1 corresponding to the value of said master clock time signal when said third time signal is transmitted;

(5) determining a value ST_1 of said slave clock time signal when said third time signal is received by said slave clock;

(6) upon receipt of said second and third time signals at said slave clock, determining a virtual clock reference time t_{ref} given by

$$t_{ref}=[(MT_0+MT_1)-(ST_0+ST_1)]/2; \text{ and}$$

(7) at said slave clock, calculating a virtual clock value T_{sc} given by

$T_{sc}=t_{ref}+n_{pc}$

where n_{pc} is the number of slave clock time signal increments.

4,893,319

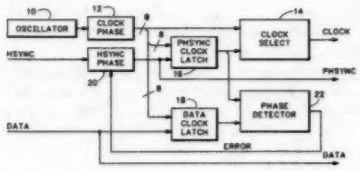
CLOCK REGENERATION CIRCUIT EMPLOYING DIGITAL PHASE LOCKED LOOP

Michael J. Zlochkovski, Portland, Oreg., assignor to Planar Systems, Inc., Beaverton, Oreg.

Filed Dec. 19, 1988, Ser. No. 286,288

Int. Cl.[4] H04L *7/04*

U.S. Cl. 375—111 **8 Claims**



6. A clock regeneration network for phase locking a data signal to both a synchronization signal and a clock signal comprising oscillator means for producing multiple phase regenerated clock signals, a synchronization latch circuit and a data latch circuit for selecting desired ones of said multiple phase clock signals, a phase regenerated comparator for comparing the respective outputs of said latch circuits and for producing an error signal to adjust the phase of said synchronization signal to bring it into coincidence with the data signal input and to select one of said clock signals as a clock pulse whereby said clock pulse is in phase with both said data signal and said synchronization signal.

4,893,320

APPARATUS FOR COUNTING PARTICLES ATTACHED TO SURFACES OF A SOLID

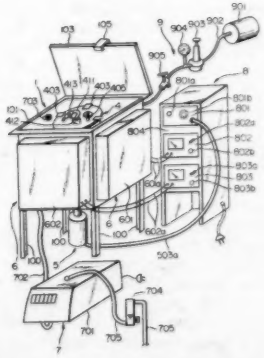
Motonori Yanagi; Masaharu Hama; Nobuyoshi Hattori, and Takaaki Fukumoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1988, Ser. No. 246,743

Claims priority, application Japan, Jun. 8, 1988, 63-139540

Int. Cl.[4] G01N *15/10, 29/02;* **B08B** *3/12*

U.S. Cl. 377—11 **19 Claims**



1. An apparatus for counting particles attached to surfaces of a solid comprising: an external tank; an internal tank disposed within said external tank, said internal tank being capable of hermetically accommodating a measuring liquid into which a sample having particles attached to the surfaces thereof is to be immersed, a driving means for rotating said internal tank with respect to said external tank, a sonic wave generating means for generating sonic waves having a plurality of different frequencies toward said internal tank, and a measuring means connectable to said internal tank in a hermetic fashion for counting the number of particles in the measuring liquid that have been removed from said sample by the sonic waves generated from said sonic wave generating means.

4,893,321

X-RADIATOR, PARTICULARLY FOR PRODUCING INTRA-ORAL DENTAL EXPOSURES

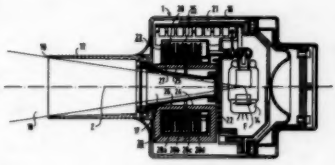
Dorothea Eitner, Erlangen; Hermann Kuehnke, Muenchaurach; Elisabeth Messingschlager, Wiesenttal, and Dorothea Wilke, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,180

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639773

Int. Cl.[4] H01J *35/16*

U.S. Cl. 378—121 **15 Claims**



1. An x-radiator, for producing intra-oral dental exposures, said x-radiator comprising a common housing having a barrel with a first axis at one end of the housing, an x-ray tube having a window for emitting x-ray beams on a beam path, a high-voltage generator having a high-voltage transformer, said high-voltage transformer comprising a tubular winding extending on a longitudinal axis of symmetry with an inside wall forming an axial opening extending on said longitudinal axis, said transformer being positioned in the housing adjacent the barrel with the axial opening being parallel to the first axis of the barrel, said x-ray tube being positioned at an end of the transformer opposite the barrel with the window arranged so that the x-ray path extends along the longitudinal axis and through the axial opening to the barrel of the housing.

4,893,322

FILM CHANGER

Mark Heilmick, Canoga Park; Leif A. Johansson, Agoura, and Otto Weber, Chatsworth, all of Calif., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Nov. 15, 1985, Ser. No. 798,310

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] G03B *42/02*

U.S. Cl. 378—173 **43 Claims**

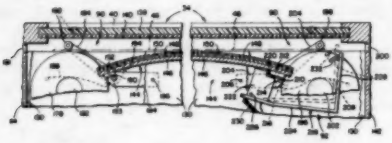
5. A medical film exposure device for an x-ray apparatus, which comprises:

a backing plate;

a pressure plate mounted in opposed relationship to the backing plate such that a film to be exposed can be positioned between the backing plate and the pressure plate, the pressure plate having a natural substantially flat configuration;

means for moving the pressure plate toward and away from the backing plate, to clamp and release the film, respectively; and

means for flexing the pressure plate from its natural substantially flat configuration into a convex configuration as the pressure plate is moved away from the backing plate, with outer ends of the pressure plate returning to initial positions as the pressure plate is moved toward the backing plate and back to its natural substantially flat configuration, such that the pressure plate applies pressure to the unexposed sheet of film progressively outward from the center of the sheet of film to opposite ends thereof.

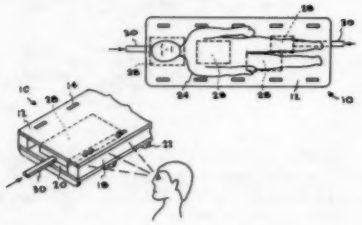


4,893,323

COMBINATION PORTABLE X-RAY TABLE AND STRETCHER

Charles F. Cook, III, 1437 Dunigan Pl., Manteca, Calif. 95336

Filed Jul. 19, 1988, Ser. No. 221,437
Int. Cl.[4] A61B 6/04
U.S. Cl. 378—208 **16 Claims**



10. A portable apparatus for immobilizing a patient during transportation and subsequent x-ray examination, comprising:

a substantially rectangular base;

a pair of transparent side supports mounted to the base and extending along two opposed sides thereof;

a flat, rigid, low x-ray attenuation top support made of a material with an aluminum equivalence of about 1 mm or less and mounted to the side supports in a spaced relation to the base, and defining with the base and side supports an open channel comprising means for the insertion of an x-ray cassette and extending between two open ends of the apparatus;

the base, side supports and top support forming a portable unit.

4,893,324

PORTABLE FIRE DETECTION SYSTEM

Kenneth M. Scown, 2603 Laramie Gate Cir., Pleasanton, Calif. 94566

Filed Feb. 16, 1989, Ser. No. 311,645
Int. Cl.[4] H04M 11/04; G08B 17/12
U.S. Cl. 379—40 **1 Claim**

1. A portable fire detection and alarm system including a power supply and monitor unit, said detection and alarm system comprising:

a plurality of ionization type smoke detectors having a pair of power input terminals, and a pair of alarm output terminals that are electrically interconnected by the detection of smoke, each pair of input and output terminals being connected to respective pair of conductors having first and second ends, each ends of said respective pair of conductors being coupled to the power supply and monitor unit;

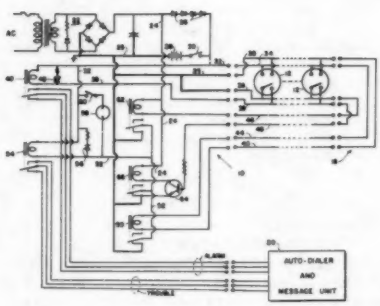
the power supply and monitor unit including:

a power supply providing a first DC power source provided by rectified AC input power and a second DC power source derived from batteries rechargeable from said first power source, said first and second sources having a common ground;

first circuitry coupling said second DC. power source and said common ground to the first ends of said pair of smoke detector power input lead conductors;

second circuitry coupling the first end of a first one of said pair of smoke detector alarm output conductors to said common ground and the first end of a second one of said pair of smoke detector alarm output conductors to one end of the excitation coil of an alarm relay, the second end of the excitation coil of said alarm relay being coupled to said second DC source;

a telephone auto-dialer and message transmitter coupled to the relay contacts of said alarm relay and responsive to the energizing of said alarm relay for transmitting a prerecorded alarm message to a predetermined telephone number;



a first supervisory relay having a coil coupled to the second ends of said pair of said smoke detector power input conductors, the contacts of said relay normally connecting a supervisory conductor to common ground, the excitation of said first supervisory relay coil removing said supervisory conductor from said ground;

second and third supervisory relays each having a first coil end coupled to the second ends of said pair of smoke detector alarm output conductors and a second coil end coupled to said first DC power source, the contacts of said second and third supervisory relays normally connecting said supervisory conductor to common ground; and

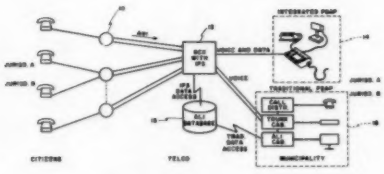
a trouble signaling relay having its coil coupled between said second DC source and said supervisory conductor, said trouble signaling relay being energized by a loss of AC input power and absence of continuity through the smoke detector power input and output alarm circuit conductors, and said telephone auto-dialer and message transmitter coupled to the contacts of said trouble signaling relay and responsive to the energizing of said trouble signaling relay for transmitting a prerecorded trouble message to a predetermined telephone number.

4,893,325

INTEGRATED PUBLIC SAFETY ANSWERING POINT SYSTEM

Andrew W. Pankonen, Naperville; Donald J. Jester, Lisle; Robert J. Mulrow, Wheaton; Catherine P. Modica, West Chicago, and John M. Zdenek, Riverside, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 23, 1988, Ser. No. 248,855
Int. Cl.[4] H04M 3/54
U.S. Cl. 379—45 8 Claims



1. A telephone call distribution system for handling a special type call, said call containing at least automatic number identification (ANI) data, comprising:

at least one central switching location for receiving said call and having means for processing;

means for interfacing with an automatic location identification (ALI) data base having ALI data associated with said ANI data, said means for interfacing receiving said ANI data from said means for processing and returning said ALI data to said means for processing, and having means for storing said ALI data associated with said call; and

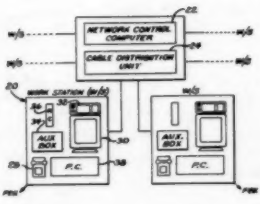
means for connecting said means for processing to at least one remotely located terminal means for receiving said call, said means for processing also sending said ALI data to said terminal means.

4,893,326

VIDEO-TELEPHONE COMMUNICATIONS SYSTEM

Joe W. Duran, Austin; Michael L. Kenoyer; Edward H. Cooper, Jr., both of San Antonio, and JoonYoul Maeng, Austin, all of Tex., assignors to Video Telecom Corp., Austin, Tex.

Filed May 4, 1987, Ser. No. 46,248
Int. Cl.[4] H04N 1/42
U.S. Cl. 379—53 13 Claims



1. A communication system for permitting simultaneous voice and video communication between two or more parties comprising:

(i) a work station for each party, said work station including:

(a) audio means for providing audio communications via an audio transmission path,

(b) video means for providing video communications via a video transmission path,

(c) computer means for initiating and supporting audio and video communications over said transmission paths,

(d) means for interfacing the video and audio means with said transmission paths responsive to said computer means;

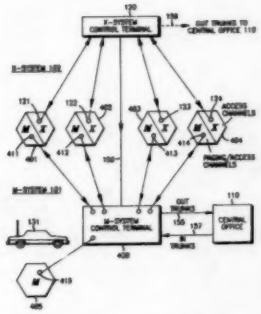
(ii) network control means in said video transmission path for coordinating video communications among work stations including means for dynamically assigning transmit and receive frequencies for each participating work station and for dynamically reassigning receive frequencies during communication to achieve a video-follows-voice mode.

4,893,327

COLOCATED CELLULAR RADIOTELEPHONE SYSTEMS

Morton Stern, Skokie, and James Williams, Lombard, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 75,914, Jul. 20, 1987, Pat. No. 4,799,253.
This application Nov. 25, 1988, Ser. No. 276,495
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—59 6 Claims



1. A method of controlling operation of a first cellular radiotelephone system pre-existing in a geographical area by a second cellular radiotelephone system wherein fixed site radio apparatus of said second cellular radiotelephone system is located in each cell including fixed site radio apparatus of said first cellular radiotelephone system, said method comprising the steps of:

operating all fixed site radio apparatus of said first cellular radiotelephone system in an access-only mode for processing radiotelephone calls directed thereto;

operating all fixed site radio apparatus of said second cellular radiotelephone system in a paging/access mode for processing all calls originated by radiotelephones in each cell of said first and second cellular radiotelephone systems; and

directing a predetermined percentage of telephone calls originated by radiotelephones from said second cellular radiotelephone system to said first cellular radiotelephone system.

4,893,328

AUTOMATED TELEPHONE OPERATOR OVERFLOW DEVICE

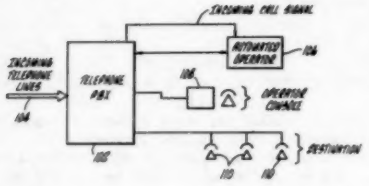
Gregory Peacock, Laguna Beach, Calif., assignor to Microvoice Systems Corporation, Irvine, Calif.

Filed Jul. 31, 1987, Ser. No. 80,679
Int. Cl.[4] H04M 3/50
U.S. Cl. 379—67 9 Claims

1. In a telephone answering system having a plurality of destinations and at least one routing point for arrival of incoming calls, an automated telephone answering device, comprising

measurement means for measuring the number of incoming calls for a recent period of time of predetermined length;

automated routing means for routing incoming calls to their destinations; and



means, responsive to said measurement means, for engaging said automated routing means when said number of incoming calls for said recent period of time exceeds a predetermined value.

4,893,329

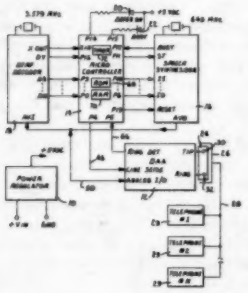
CALL DEFERRAL SYSTEM FOR TELEPHONES

Terry D. O'Brien, 6310 W. 50th St., Mission, Kans. 66202

Filed Sep. 20, 1988, Ser. No. 246,980

Int. Cl.[4] H04M *1/64, 1/66*

U.S. Cl. 379—88 **21 Claims**



21. Telephone call deferral apparatus for deferring telephone calls on a subscriber telephone line having a telephone set that functions in a normal operating mode to receive incoming calls from calling parties and generate a ring signal when an incoming call is received, said apparatus comprising:

means for receiving signals entered at the telephone set commanding initiation of a user selected defer period during which incoming calls to the telephone set are to be interrupted and after which incoming calls are to be received;

means for intercepting incoming calls and suppressing the ring signal during the defer period;

means responsive to the interception of an incoming call for transmitting to the calling party a message indicating when the defer period will have expired; and

means for automatically effecting the normal operating mode upon expiration of the defer period.

4,893,330

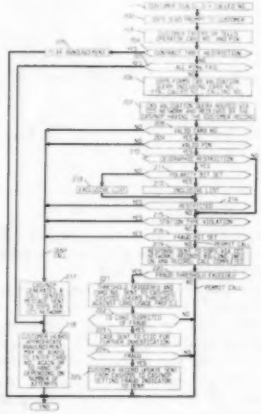
METHOD AND APPARATUS FOR RESTRICTING CREDIT CARD COMMUNICATION CALLS

Victor A. Franco, Old Bridge, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, New York, N.Y.

Filed Jun. 1, 1989, Ser. No. 360,178

Int. Cl.[4] H04M *3/38, 11/00*

U.S. Cl. 379—91 **27 Claims**



1. In a data base system, a method of providing a calling charge validation service for determining whether a communication call connection should be complete by an associated communication switching syste , the method characterized by the steps of

receiving from said switching system a call message including a call billing code and a dialing sequence identifying the destination of a call,

accessing a data base associated with said billing code to obtain stored dialing data which identifies potential destinations for said call, and

comparing the dialing sequence against said stored dialing data and, in response to said comparison, signaling said switching system to control a call connection to the destination determined by said dialing sequence.

4,893,331

SYSTEM ALLOWING SELECTIVE CONNECTION OF VARIOUS TYPES OF EXTERNAL APPARATUSES TO TELEPHONE SET

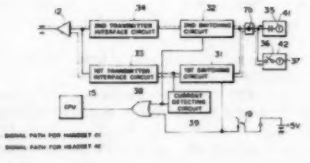
Takeshi Horiuchi, Hino; Yasuji Sato, Hachioji, and Yasuo Funato, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 19, 1988, Ser. No. 157,808

Claims priority, application Japan, Feb. 24, 1987, 62-40595; Mar. 20, 1987, 62-66669

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—93 **12 Claims**



8. A system allowing selective connection of various types

of external apparatuses to a telephone set, the various types of external apparatuses including a first external apparatus having a manual operating switch, the manual operating switch being turned on at times when the first external apparatus is in use, and a second external apparatus having a hook switch, the hook switch being turned on at times when the second external apparatus is in use, the system comprising:

a connection terminal to which the first external apparatus and the second external apparatus are connected in parallel;

first interface means for receiving a signal from the first external apparatus, the first interface means having a first characteristic corresponding to the first external apparatus and including a current supply source for supplying current to the first external apparatus;

second interface means for receiving a signal from the second external apparatus, the second interface means having a second characteristic corresponding to the second external apparatus;

first switching means provided between the first interface means and the connection terminal for selectively connecting the first interface means to the connection terminal;

second switching means provided between the second interface means and the connection terminal for selectively connecting the second interface means to the connection terminal;

current detecting means for detecting an output current of the current supply source of the first interface means when the manual operating switch of the first external apparatus is operated;

first control means for turning off the first switching means when the hook switch is turned on; and

second control means for turning off the second switching means in response to an output of the current detecting means.

4,893,332

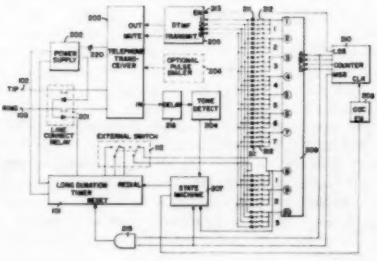
LOW-POWERED REMOTE SENSOR

Richard W. Brown, Mound, Minn., assignor to Aquatrol Corporation, Arden Hills, Minn.

Continuation of Ser. No. 862,124, May 12, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,496

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—97 **18 Claims**



4. A remote transmitting device for periodically reporting to a central station over a telephone line comprising:

telephone interfacing means electrically connected to the telephone line for transmitting information;

automatic dialing means connected to said telephone interfacing means for transmitting a telephone number corresponding to the central station;

timer means connected to said dialing means for periodically causing said automatic dialing means to transmit said telephone number corresponding to the central station; and

low-power source means capacitively connected to the telephone line for drawing inductively coupled AC power from a long wire line and for powering said timer means.

11. A remote utility sensing device for monitoring a utility meter and reporting utility usage to a portable peripheral device, comprising:

sensing means connected to the utility meter for generating digital pulses in response to the utility usage;

counter means connected to said sensing means for counting and storing said digital pulses;

interface means connected to said counter means for transmitting values stored in said counter means to the portable peripheral device; and

power source means capacitively coupled to a long wire for drawing inductively coupled AC line power, and further operable for rectifying and low-pass filtering said power for powering said remote utility sensing device.

4,893,333

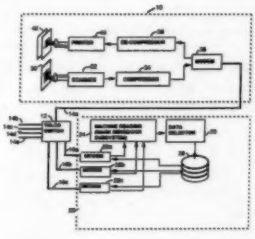
INTERACTIVE FACSIMILE SYSTEM AND METHOD OF INFORMATION RETRIEVAL

Paul Baran, 83 James Ave., Atherton, Calif. 94025, and David F. Baran, 1324 Josephine St., Berkeley, Calif. 94703

Filed Mar. 14, 1989, Ser. No. 323,282

Int. Cl.[4] H04M *11/08*; H04N *1/42*

U.S. Cl. 379—100 **19 Claims**



1. A FAX server apparatus for interactively providing requested portions of stored information to an inquiring CCITT FAX transceiver by means of a machine readable information selector sheet marked by the requesting party and transmitted by the inquiring FAX transceiver to the FAX server via telephone lines, said FAX server comprising:

CCITT modem means for communicating with said CCITT FAX transceiver to electronically receive said transmitted selector sheet and to transmit the requested information;

machine readable means for interpreting the machine readable markings on the selector sheet received by said CCITT modem means;

memory means for storing the information from which the requestor can select; and

retrieval means under the control of said machine readable means for retrieving the information requested by the requesting party from said memory means and coupling the retrieved information to said CCITT modem means.

4,893,334

INTERCOMMUNICATION SYSTEM FOR TELEPHONES

Nicholas G. Parnello, Rockford, Ill., assignor to Power Play, Chicago, Ill.

Filed Aug. 28, 1987, Ser. No. 90,741

Int. Cl.[4] H04M *9/02*; H04Q *5/02*

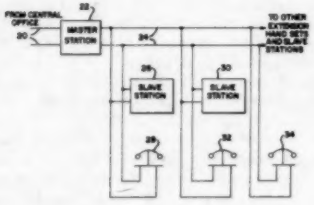
U.S. Cl. 379—157 **15 Claims**

1. An apparatus for using a plurality of telephone handsets

on a single wire pair connected to a telephone exchange as an extension for an intercom system, the apparatus comprising:

means for disconnecting the single wire pair from the telphone exchange in response to a signal from a first handset;

a slave station connected to the single wire pair including a paging speaker;



means for enabling said paging speaker at said slave station thereby permitting paging from the first handset;

means for disabling the paging speaker when a second handset goes off-hook to enable voice communication between the first handset and the second handset; and

means for connecting the single wire pair to the telephone exchange when the first and second handset are go on-hook.

4,893,335

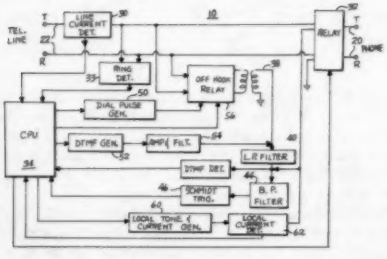
REMOTE ACCESS TELEPHONE CONTROL SYSTEM

Robert M. Fuller, Redmond; Frederick A. Epler, Issaquah, and Maxwell E. Manowski, Enumclaw, all of Wash., assignors to Fuller Research and Development Company, Bellevue, Wash.

Continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 841,931

Int. Cl.[4] H04M *1/274, 1/53, 1/66;* **H04Q** *7/04*

U.S. Cl. 379—200 **56 Claims**



1. A telephone control system connected between a telephone line and a local telephone station, said system comprising:

a decoder for determining numbers being dialed by said local station and outputting information signals corresponding thereto;

a dialer selectively placing on said telephone line dialing signals corresponding to digit identifying signals;

processor means receiving the information signals from said decoder, said processor means examining information signals corresponding to numbers being dialed, determining if said information signals have a predetermined value, recording the information signals for numbers being dialed at least up until the time that said processor means determines if a call over said telephone line is being attempted and, in response to said processor means determining that a call over said telephone line is being attempted and within a period thereafter that is independent of the rate of subsequently dialing digits, outputting to said dialer digit identifying signals corresponding to the information signals recorded by said processor means at least up until the time that said processor means has determined that a call over said telephone line is being attempted thereby placing dialing signals corresponding to said information signals on said telephone line; and

a switch actuatable to a first position in which said telephone station is connected to said telephone line, said switch being actuated by said processor means to said first position responsive to said processor means determining that a call over said telephone line is being attempted and after said processor means has outputted to said dialer the digit identifying signals corresponding to all information signals recorded in said processor means prior thereto, whereby after said switch has been activated to said first position, said dialing signals are thereafter placed on said telephone line in real time as they are generated by said local telephone station.

16. A system for reporting to a central telephone station the telephone number associated with a telephone unit having an identifying number and being connected to a telephone line, comprising:

inhibit means for rendering said telephone unit inoperable until the telephone number associated with said telephone unit has been entered into said telephone unit;

storage means for storing the telephone number associated with said telephone unit; and

dialing means for automatically causing said telephone unit to dial the telephone number of said central telephone station and, after said central telephone station has gone off-hook, dialing the telephone number associated with said telephone unit and a number corresponding to said identifying number thereby informing said central telephone station the telephone number to which said telephone unit is connected.

18. A remotely accessible telephone control system for connection to a telephone line from a telephone exchange, the telephone exchange providing a user controlled call conferencing function, the system comprising:

detector means for detecting signals on said telephone line;

signal generating means responsive to control signals to produce predetermined signals and apply said signals to said telephone line;

memory means for controllably storing electronic signals; and

central processing means for monitoring signals on said telephone line as detected by said detector means, accessing said memory means and producing and applying predetermined control signals to said signal generating means, said central processing means including means for:

(a) identifying a call to said system from a remote user,

(b) identifying a control signal from said remote user indicating a desired call transfer to a predetermined number,

(c) receiving and storing said predetermined transfer number from said remote user,

(d) activating the call conferencing function of the telephone exchange to place the remote user on hold,

(e) producing control signals to cause the signal generating means to apply appropriate signals to said telephone line to complete a call to said predetermined transfer number,

(f) further activating said telephone exchange to connect said remote user to said predetermined transfer number,

(g) detecting the completion of the call between said remote user and said transfer number and, in response thereto,

(h) repeating items (b) through (f) to allow said remote user to call a further transfer number.

25. A remotely accessible telephone control system for connecting to a telephone line from a telephone exchange, the telephone exchange providing a user controlled call conferencing function, the system comprising:

detector means for detecting signals on said telephone line;

signal generating means responsive to control signals to produce predetermined signals and apply said signals to said telephone line;

memory means for controllably storing electronic signals; and

central processing means for monitoring signals on said telephone line as detected by said detector means, accessing said memory means and producing and applying predetermined control signals to said signal generating means, said central processing means including means for:

(a) identifying a call to said system from a remote user,

(b) activating the call conferencing function of the telephone exchange to place the remote user on hold,

(c) recalling from said memory means a predetermined transfer number,

(d) producing control signals to cause the signal generating means to apply appropriate signals to said telephone line to complete a call to said predetermined transfer number,

(e) further activating said telephone exchange to connect said remote user to said predetermined transfer number,

(f) identifying a call from a remote user indicating a desired change in said predetermined transfer number,

(g) receiving from said remote user the new transfer number, and

(h) loading into said memory said new predetermined number.

4,893,336

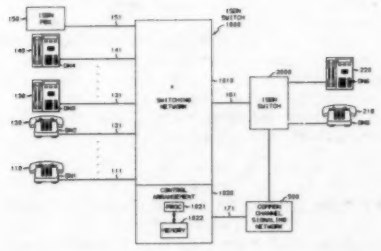
CALL FORWARDING ARRANGEMENT

Mark S. Wuthnow, Hazlet, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 17, 1987, Ser. No. 134,649

Int. Cl.[4] H04M *3/54*

U.S. Cl. 379—211 **5 Claims**



5. A method of processing a call to a communication station comprising

determining whether said call is a forwarded call;

in response to a determination that said call is a forwarded call, performing at least one of the following steps (A) and (B): (A) effecting generation of an altering signal distinctive from an alerting signal for a non-forwarded call, and (B) completing said call to said station; and

in response to a determination that said call is a non-forwarded call, performing one of the following steps (C) and (D): (C) denying said call, and (D) forwarding said call to another communication station

wherein said first-mentioned station is connected to a switch and wherein said method is performed by said first-mentioned station.

4,893,337

CIRCUIT ARRANGEMENT FOR A DIGITAL TELEPHONE STATION

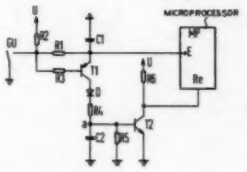
Dieter Blossfeldt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,226

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725329

Int. Cl.[4] H04M *1/00*

U.S. Cl. 379—424 **1 Claim**



1. A circuit arrangement for a digital telephone station in digital telephone systems whereby the telephone station is controlled by a microprocessor which includes a control input and a rest input, and whereby inquiry and control signals are constantly exchanged via the leads of the subscriber line, and whereby a feed voltage supply of the telephone station in the quiescent condition and in the voice condition occurs by way of the subscriber line or by way of a local voltage source, the improvement comprising:

cradle switch means for bringing said control input of said microprocessor to ground potential when said cradle switch means is in its actuated position;

a first resistor connected between said control input and said cradle switch means;

a first capacitor including first and second terminals, said first terminal of said first capacitor connected to said control input, said second terminal of said first capacitor connected to ground;

a second resistor including first and second terminals, said first terminal of said second resistor connected to a second terminal of said first resistor, said second terminal of said second resistor connected to said feed voltage;

a pnp first transistor having a collector, an emitter, and a base, said emitter of said pnp first transistor connected to said first terminal of said first capacitor;

a third resistor connected between said cradle switch means and said base of said pnp first transistor; and

a diode including an anode connected to said collector of said first pnp transistor, and a cathode;

a fourth resistor including a first terminal connected to said cathode of said diode, and a second terminal;

a second capacitor including a first terminal connected to said second terminal of said fourth resistor and a second terminal connected to ground;

a fifth resistor connected in parallel with said second capacitor;

an npn second transistor having a base, an emitter and a collector, said emitter of said npn second transistor connected to ground, said base of said npn second transistor connected to said first terminal of said second capacitor; and

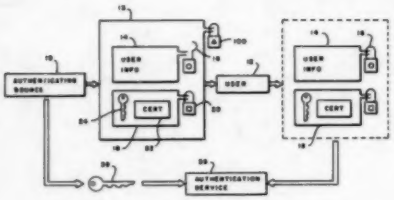
a sixth resistor including a first terminal connected to said collector of said second npn transistor and to said reset input of said microprocessor, and a second terminal connected to said feed voltage.

4,893,338

SYSTEM FOR CONVEYING INFORMATION FOR THE RELIABLE AUTHENTIFICATION OF A PLURALITY OF DOCUMENTS

Jose Pastor, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 31, 1987, Ser. No. 140,051
Int. Cl.[4] H04L 9/00
U.S. Cl. 380—25 **11 Claims**



1. A system for authenticating a plurality of documents, said system comprises:

an authenticating source, said authenticating source including means for providing a first public key encryption key to a third party;

means, associated with said source, for providing an authentication message to said third party in the form of coefficient of a polynomial, said authentication message being encrypted by a second public key encryption key and including the decryption key for said first public key encryption key;

means, associated with said third party, for generating variables and values to said polynomial and applying different ones of said variables and value to each of said plurality of documents;

means, associated with an authenticating service, for recovering said authentication message from a plurality of different ones of said variables and values; and

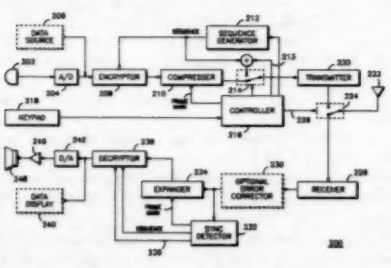
means, associated with said source, for providing the decryption key corresponding to said second public key encryption key to said authenticating service such that said authentication message can be decrypted.

4,893,339

SECURE COMMUNICATION SYSTEM

Michael W. Bright, Arlington Heights; Eric F. Ziolko, Schaumburg; Alan L. Wilson, Hoffman Estates; Michelle M. Bray, Schaumburg; Harry A. Hennen, Woodstock, and David L. Weiss, Roselle, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1986, Ser. No. 903,360
Int. Cl.[4] H04K 1/00
U.S. Cl. 380—28 **53 Claims**



45. In a secure communication system, a method for communicating a voice signal from a transmitter to at least one receiver, comprising the steps of:

at the transmitter:

(a) digitizing the voice signal to provide a digitized signal;

(b) encrypting said digitized signal to provide an encrypted signal;

(c) discarding every Nth bit of said encrypted signal;

(d) time compressing the remaining encrypted signal to provide a compressed signal;

(e) generating a pseudo-random synchronization signal;

(f) inserting at least a portion of said pseudo-random synchronization signal into said compressed signal to provide a combined signal;

(g) transmitting said combined signal to at least one receiver;

at the receivers:

(a) receiving the transmitted signal to provide a received signal;

(b) inverting said received signal to provide an inverted signal;

(c) loading, in parallel, at least a portion of said received signal into a first sequence generating means;

(d) generating a first local pseudo-random synchronization sequence;

(e) comparing said local pseudo-random synchronization sequence and said received signal to provide an error count;

(f) providing a first pseudo-random synchronization signal if said error count is below a predetermined threshold else repeating from step (c);

(g) loading, in parallel, at least a portion of said inverted signal into a second sequence generating means;

(h) generating a second local pseudo-random synchronization sequence;

(i) comparing said second local pseudo-random synchronization sequence and said inverted signal to provide an error count;

(j) providing a second pseudo-random synchronization signal if said error count is below a predetermined threshold else repeating from step (c);

(k) providing either said received signal or said inverted signal to a predictor in response to said first and second pseudo-random synchronization signals;

(l) predicting every Nth bit of said received signal in response to step (k);

(m) interleaving said predicted bits with their respective signals to provide an expanded signal;

(n) decrypting said expanded signal to provide a decrypted signal;

(o) converting said decrypted signal into an analog signal comprising the voice signal.

4,893,340

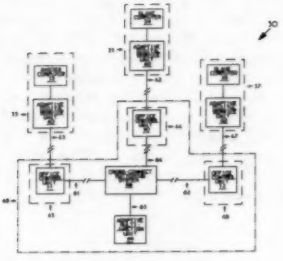
MULTIJUNCTION UNIT APPARATUS FOR USE IN A DIGITAL NETWORK

Daniel P. Lubarsky, San Jose; George A. Weigt, Livermore, and Mark E. Haisch, Freemont, all of Calif., assignors to Pacific Bell, San Francisco, Calif.

Filed Oct. 5, 1988, Ser. No. 254,275
Int. Cl.[4] H04L 9/00
U.S. Cl. 380—50 **18 Claims**

1. A multijunction unit for transferring digital data between at least three channels of a time-domain multiplexed communication link of a multipoint communication network which includes a plurality of network units with at least one of said network units comprising said multijunction unit, said network units coupled to telephone system communication links, each said network unit comprising means for transmitting and receiving digital data in a frame mode in which said data is organized into frames on said communication links, each said frame including synchronization data, command data, error correcting data, and user data, each said network unit further comprising:

means for storing an address identifying said network unit;
means for receiving commands from other network units in said computer network, said commands being specified by command data in a said frame received by said network unit;
means for generating command data in response to a received command included in said command data;
means for transmitting commands to other network units in said computer network, said transmitting means comprising means for inserting command data generated by said command data generating means into a said frame transmitted by said network unit; and
means for executing a said received command specifying said stored address as the target thereof;
said multijunction unit further comprising:
first, second, and third input port means, each said input port means being coupled to a different incoming channel of a time-domain multiplexed communication link, each said input port means comprising means for receiving a primary channel word from the said incoming primary channel coupled thereto and first decrypting means for generating a data word corresponding to each said received primary channel word, each said generated data word comprising a portion of a said frame;
first, second, and third output port means, each said output port means being coupled to a different primary outgoing channel of said time-domain multiplexed communication link, each said output port means comprising means for receiving a said data word, first encrypting means for generating a said primary channel word from said received data word and means for transmitting said primary channel word on the said outgoing primary channel coupled thereto;
means for coupling a data word generated by said first input channel to the said receiving means in said second and third output port means; and
means for combining the said data words generated by said second and third input port means to form a combined data word and for coupling said combined data word to the said receiving means in said first output port means.

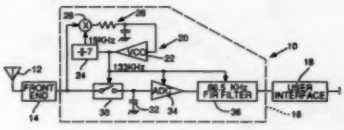


4,893,341
DIGITAL RECEIVER OPERATING AT SUB-NYQUIST SAMPLING RATE

Mark R. Gehring, Portland, Oreg., assignor to AT&E Corporation, San Francisco, Calif.

Filed Aug. 1, 1989, Ser. No. 388,186
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—7 4 Claims

1. A receiver for receiving an amplitude modulated subcarrier, said subcarrier being transmitted as part of an RF composite signal that includes a pilot signal, the receiver including:
a front end for converting the RF composite signal to a baseband composite signal;
a frequency source for producing a sampling clock signal;
means for phase locking said frequency source to the pilot signal in the baseband composite signal;
sampling means for sampling said composite signal at a rate determined by the sampling clock signal;
analog to digital conversion means for converting the samples produced by the sampling means into digital form;

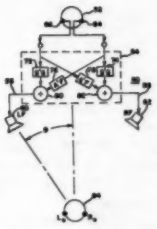


digital filter means for digitally filtering said digitized samples to attenuate the non-subcarrier components thereof;
wherein said sampling clock signal has a frequency less than twice the maximum frequency of the modulated subcarrier.

4,893,342
HEAD DIFFRACTION COMPENSATED STEREO SYSTEM

Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61821, and Jerald L. Bauck, 1007 W. Clark #4, Urbana, Ill. 61801

Filed Oct. 15, 1987, Ser. No. 109,197
Int. Cl.[4] H04R *5/027*
U.S. Cl. 381—26 20 Claims



1. An audio processing system for generating compensated audio signals suitable for reproduction through a loudspeaker system, comprising:
source means for providing two channels of audio signals having head-related transfer functions imposed thereon;
compensation means for providing cross-talk cancellation of the audio signals and for providing naturalization compensation of the audio signals to correct for propagation path distortion including filtering means for substantially modifying frequency and phase response of the cross-talk cancellation and naturalization compensation at frequencies beginning at a frequency above 600 hertz and beginning at least at a frequency below ten kilohertz in such a way as to release the cross-talk cancellation at such high frequencies thereby generating compensated audio signals.

4,893,343
DUAL DIVERGING MANIFOLD LOUDSPEAKER SYSTEM

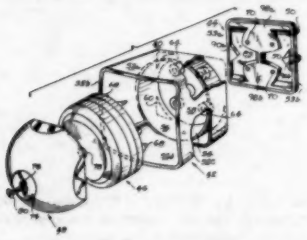
Joseph F. Bader, Crete, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

Filed Jan. 13, 1989, Ser. No. 296,839
Int. Cl.[4] H04R *1/30, 1/34;* G01K *9/00, 9/12*
U.S. Cl. 381—156 20 Claims

15. A dual diverging manifold loudspeaker system comprising:
first diverter means for diverting a rearwardly-traveling

planar sound wavefront into two diverging sound wavefronts;

second diverter means for splitting said two diverging sound wavefronts into four separate planar wavefronts;



reflector means for deflecting forwardly said four separate planar wavefronts toward an open mouth of said loudspeaker system; and

manifold means for recombining said four separate planar wavefronts back into a single composite wavefront emanating from the open mouth ofsaid loudspeaker system.

4,893,344

HEADSET HAVING A POST AURICLE MOUNT AND ARRANGED TO BE WORN ON A PERSON'S OUTER EAR

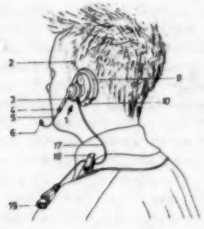
Jan Trägardh, Copenhagen K; Bjarne Jönsson, Bronsboj, and Finn Jensen, Struer, all of Denmark, assignors to GN Netcom A/S, Copenhagen, Denmark

Filed Sep. 23, 1988, Ser. No. 248,490

Claims priority, application Denmark, Sep. 30, 1987, 5152/87

Int. Cl.[4] H04M *1/05*

U.S. Cl. 381—187 **4 Claims**



1. A headset with sound receiving microphone and sound reproducing transducer, arranged to be worn on a person's outer ear, comprising

a curved post auricle mount arranged to be positioned behind the ear and configured to be lengthwise adjustable, said mount including a stabilizer part having substantially the same curvature as the mount, and being extractable from said mount, said mount further being coupled to said sound reproducing transducer by a joining link means for providing rotation of said mount in two orthogonal axis.

4,893,345

METHOD FOR DETECTING/PROCESSING IMAGE INFORMATION

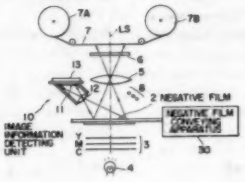
Fumio Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1987, Ser. No. 40,238

Claims priority, application Japan, Apr. 28, 1986, 61-99208; Apr. 30, 1986, 61-99875; Apr. 30, 1986, 61-99876

Int. Cl.[4] G06K *9/28*

U.S. Cl. 382—1 **12 Claims**



1. A method for detecting and processing image information comprising the steps of: moving an original film and a two-dimensional sensor relatively to each other; photometrically measuring images on said original film with said two-dimensional sensor; wherein outputs from picture element arrays, detected at a relatively smaller pitch than the pitch of said two-dimensional sensor, are processed to interpolate a picture element pitch; and, wherein data from plural said picture element arrays corresponding to a predetermined detection scope are synthesized to thereby achieve detection of image information at high speed and a high resolution.

4,893,346

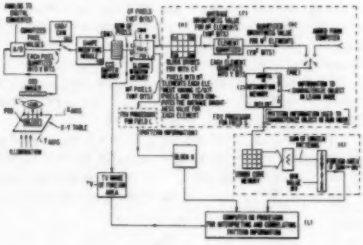
APPARATUS FOR AUTOMATICALLY INSPECTING OBJECTS AND IDENTIFYING OR RECOGNIZING KNOWN AND UNKNOWN PORTIONS THEREOF, INCLUDING DEFECTS AND THE LIKE, AND METHOD

Robert Bishop, Brookline, Mass., assignor to Beltronics, Inc., Brookline, Mass.

Continuation of Ser. No. 711,995, Mar. 14, 1985, abandoned. This application Sep. 2, 1987, Ser. No. 93,114

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—8 **29 Claims**



1. A method of inspection of circuit board conductive shapes wherein digital signal information is stored representing desired shapes to be monitored in future board inspections, the method comprising, originally storing digital signal information representing images of desired predetermined object shapes to be learned; predetermining at least one of acceptable size or dimension variations in such object shapes; modifying the stored digital signal information to create a set of fictitious images of said object shapes to be learned that incorporates the acceptable variations therein; storing the modified digital signal information representing said fictitious images; and, during circuit board inspections, ignoring said acceptable variations as

possible defects by responding to recognition of the acceptable variations in the said fictitious stored images.

4,893,347

FM COMMUNICATION SYSTEM WITH IMPROVED RESPONSE TO RAYLEIGH-FADED COMPANDED SIGNALS

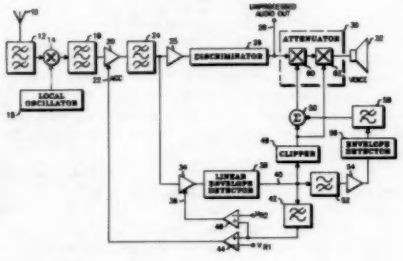
Bruce C. Eastmond, Downers Grove, and Donald L. Linder, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 926,064, Nov. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 847,962, Apr. 3, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 90,982

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[4] H04B *15/00, 1/10*

U.S. Cl. 455—52 **56 Claims**



1. An FM communication system in which speech signals are companded, that is, compressed prior to transmission and expanded after reception, comprising:

compressor means for compressing the amplitude of input speech signals;

transmitter means for transmitting the compressed speech signals via an FM signal;

receiver means for receiving the FM signal, said receiver means including discriminator means for converting the FM signal into a baseband signal containing both in-band speech signals and above-band noise;

noise reduction means for minimizing noise bursts in the in-band speech signals of said baseband signal in response to the magnitude of the above-band noise contained in said baseband signal thereby producing noise-minimized speech signals, said noise reduction means operating only when the carrier-to-noise ratio (C/N) of the received FM signal is less than a predetermined C/N; and

audio processing means including expandor means for expanding the noise-minimized speech signals to produce output speech signals which correspond to the input speech signals, said noise reduction means minimizing noise bursts without substantially adversely affecting the operation of said expandor means.

4,893,348

POWER SOURCE CONTROL DEVICE IN CAR TELEPHONE MOBILE STATION SYSTEM

Akira Andoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,460

Claims priority, application Japan, Sep. 9, 1987, 62-224012

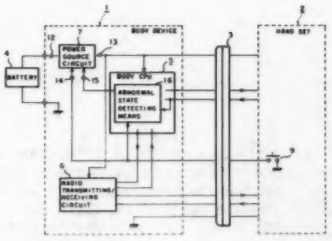
Int. Cl.[4] H04B *1/38*

U.S. Cl. 455—89 **3 Claims**

1. A car telephone mobile station system, comprising:

a body device including a body control unit, a radio transmitting/receiving circuit controlled by said body control unit, a battery for providing a source of power, and a power source circuit controlling the supply of power to said body control unit and said radio transmitting/receiving circuit from said battery in response to an ON/OFF signal;

a hand set connected to said body device and receiving power from said power source circuit including a hand set control unit communicating with said body control unit, a power source switch providing a first power source control signal for developing said ON/OFF signal to said



power source circuit, and a voice circuit for transmitting and receiving voice signals to and from said radio transmitting/receiving circuit;

a control terminal provided at said power source control circuit which receives a second power source control signal for turning said power source circuit off; and

abnormal state detecting means provided in said body control unit for detecting an abnormal state of a signal from said hand set control unit and developing said second power source control signal in response thereto.

4,893,349

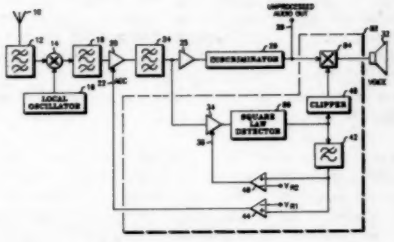
FM COMMUNICATION SYSTEM WITH IMPROVED RESPONSE TO RAYLEIGH-FADED RECEIVED SIGNALS

Bruce C. Eastmond, and Wai Elliott Lum, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 926,060, Nov. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 847,962, Apr. 3, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 91,160

Int. Cl.[4] H04B *1/10, 15/00*

U.S. Cl. 455—205 **100 Claims**



81. An FM receiver having an improved audio response for Rayleigh faded received signals comprising:

discriminator means for converting the received FM signals into audio signals; and

means for controllably attenuating said audio signals so that substantially constant attenuation is provided for received

signals greater than a certain signal level, said certain signal level consisting of a predetermined level below the average magnitude of the received signal, said attenuating means increasing attenuation of said audio signals when said received signals are less than said certain signal level, said attenuating means maintaining a substantially constant bandwidth to said audio signals.

4,893,350

INTERFERENCE CANCELLATION SYSTEM

Kenichi Minamisono; Masayuki Yasunaga; Fumio Watanbe, all of Tokyo, and Noboru Babe, Sayama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

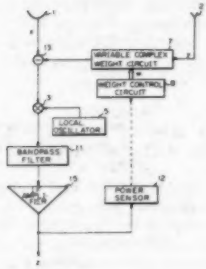
PCT No. PCT/JP87/00806, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO88/03340, PCT Pub. Date May 5, 1988

PCT Filed Oct. 21, 1987, Ser. No. 196,205

Claims priority, application Japan, Oct. 22, 1986, 61-249532; Jul. 13, 1987, 62-173013

Int. Cl.[4] H04B *1/06*

U.S. Cl. 455—278 3 Claims



1. An interference cancellation system which receives a main signal, including a desired signal and an undesired signal in a direction of a sidelobe of a main antenna, and a reference signal, which has essentially only the undesired signal, said interference cancellation system suppressing an undesired signal component in the main signal to provide a main signal which has only a desired signal component, said interference cancellation system comprising:

a main antenna positioned in a direction of the desired signal;

an auxiliary antenna positioned in a direction of the undesired signal;

a subtractor coupled with an output of said main antenna;

an output terminal coupled with an output of said subtractor;

power measuring means, coupled with the output of said subtractor, for measuring a power of the output of said subtractor in a high frequency band;

a variable complex weight circuit, coupled with said auxiliary antenna and said subtractor, said variable complex weight circuit adjusting the undesired signal received by the auxiliary antenna; and

control means, coupled to said variable complex weight circuit and said power measuring means, for controlling said variable complex weight circuit according to said output power.

4,893,351

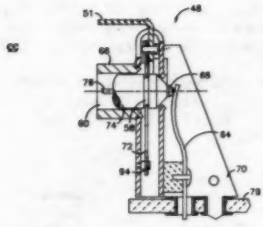
COMMUNICATION RECEIVER HAVING A REMOTE ALERT DEVICE

John M. McKee, Coral Springs, and Marilyn S. Burger, Pompano, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1987, Ser. No. 92,092

Int. Cl.[4] H04B *1/08*

U.S. Cl. 455—347 19 Claims



1. An apparatus for generating a remote alert signal from a communication receiver, the communication receiver being enclosed in a casing and having alert circuitry for generating an electrical signal in response to a selective call message, said apparatus comprising:

a latching receptacle enclosed within said casing, said latching receptacle including a locking means and a socket, said socket being accessible from outside said casing, wherein said locking means includes a means for preventing said electrical connector from disengaging or accidentally separating from said socket and said socket includes a first socket contact and a second socket contact, said first and second socket contacts operatively coupled to the alert circuitry for transmitting the electrical signal;

a removable electrical connector for engaging said socket, said electrical connector including a first pair of electrical contacts, slidably engaging said first and second socket contacts to maintain electrical connection between said first pair of electrical contacts and said first and second socket contacts while permitting rotation of said electrical connector relative to said socket, and an insulation housing enclosing a portion of said first pair of electrical contacts, wherein one of said first pair of electrical contacts comprises an outer shaft enclosed by a portion of said insulation housing and insulated by said housing, and a second of said first pair of electrical contacts comprises an inner shaft concentric with and insulated from said outer shaft;

an alerting device for generating an alert signal in response to the electrical signal, said alerting device being remote from said communication receiver and including a second pair of electrical contacts for receiving said electrical signal; and

a connector cable terminating at a first end with said electrical connector and terminating at a second end with said alerting device, said connector cable including a pair of cable conductors to provide electrical communication between said electrical connector and said alerting device, wherein the electrical signal being transmitted from the alert circuitry to said alerting device generates said alert signal;

wherein said electrical connector further comprises a means for preventing said connector cable from twisting and kinking, and wherein said outer shaft includes a proximal end being electrically coupled to one of said pair of cable conductors, and said inner shaft includes a proximal end being electrically coupled to a second of said pair of cable conductors, said inner shaft and said outer shaft extending beyond said insulation housing at a distal end to expose a

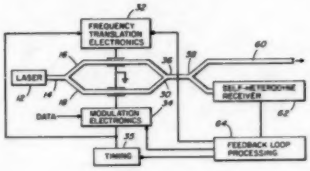
generally cone-like portion to form a mating plug, and wherein said first socket contact further comprising a leaf spring member urged into abutting relation with the distal end of said inner shaft during engagement between said electrical connector and said socket, and said second socket contact further comprising a sleeve having an inner surface urged into contact with the exposed distal end of said outer shaft during engagement between said electrical connector and said socket.

4,893,352

OPTICAL TRANSMITTER OF MODULATED SIGNALS

David Welford, Middleton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 30, 1987, Ser. No. 68,233
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—610 **27 Claims**



1. An optical waveguide modulator comprising:
an input waveguide for carrying an input optical signal;
an optical waveguide splitter for splitting the power of the input optical signal into plural signals in plural waveguides;
modulator means for modulating at least one of the plural signals such that at least one of the plural signals has negligible energy in frequency ranges of all other plural signals; and
an optical combiner for combining the signals into an output optical waveguide.

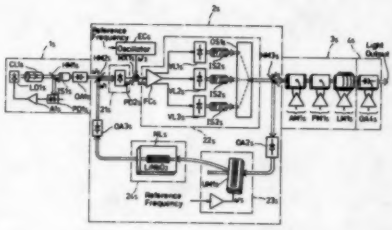
4,893,353

OPTICAL FREQUENCY SYNTHESIZER/SWEEPER

Hideto Iwaoka; Akira Ohte, and Koji Akiyama, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,448
Claims priority, application Japan, Dec. 20, 1985, 60-287162; Dec. 26, 1985, 60-294342; Jan. 24, 1986, 61-11894; Feb. 26, 1986, 61-40772; Feb. 26, 1986, 61-40773; Jun. 24, 1986, 61-96170; Jun. 26, 1986, 61-98194; Jun. 27, 1986, 61-97611; Jun. 27, 1986, 61-149777; Jul. 17, 1986, 61-168924; Aug. 26, 1986, 61-199364; Sep. 19, 1986, 61-221668
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—612 **36 Claims**

2. An optical frequency synthesizer/sweeper comprising
a reference light source for generating an optical output signal having a wavelength; and
at least one optical frequency phase locked loop for controlling the wavelength of said optical output signal and for producing an output signal;
said at least one optical frequency phase locked loop comprising a variable wavelength light source for producing an output light and an optical heterodyne detector, said optical heterodyne detector receiving as inputs light associated with said output light from said variable wavelength light source and said optical output signal from said reference light source and outputting a signal to said variable wavelength light source so that the wavelength of said output signal from said at least one optical frequency phase locked loop is made variable on the basis of the wavelength of said optical output signal from said reference light source; wherein said at least one optical frequency phase locked loop comprises an optical frequency shifter for shifting the frequency of said output light from said variable wavelength light source and for producing an output light, and wherein said output light from said optical frequency shifter is emitted and applied as an input to said optical heterodyne detector.

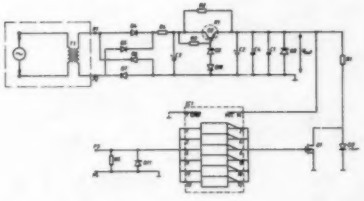


4,893,354

SYSTEM AND METHOD FOR SELF-COMPENSATING FIBER-OPTIC DATA TRANSMISSION AT TEMPERATURES UP TO 200 DEGREES C.

Erik Janzén, and Rune Tenghamn, both of Västerås, Sweden, assignors to AB ASEA-Atom, Sweden

Filed Nov. 6, 1987, Ser. No. 117,534
Claims priority, application Sweden, Nov. 7, 1986, 8604792
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—612 **9 Claims**



2. A self-compensating fiber-optic data transmission system for use at temperatures from ambient to 200° C. and at high pressure, comprising
a light source device adapted to emit light with a wavelength greater than 1100 A,
an armoured cable including an optical fiber having a head end and an upper end for the transmission of light, for example in connection with bore hole logging for communication between the head end in a bore hole and the upper end at a surface position, with contacts at the head end for connection to the light source device,
a drive unit for control of the light source device, and
a receiver for receiving the light signals from the light source device at the upper end of the cable,
wherein the light source device is adapted for continuous operation in such a way that at no temperature in the range 100°–200° C. does the output wavelength of the source device correspond to the highest peak of the wavelength/attenuation characteristic of the optical fiber.

DESIGN PATENTS

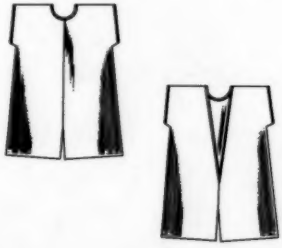
GRANTED JAN. 9, 1990

ERRATA

For CLASS	See PATENT NO.
D08-367	305,431

305,375
UNDERSHORTS
Daniel J. Beggs, P.O. Box 629, Crowley, La. 70527
Filed Nov. 8, 1988, Ser. No. 268,531
Term of patent 14 years
U.S. Cl. D2—10

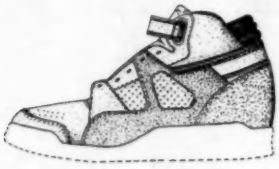
305,376
PATIENT GOWN
Susan Russell, Rte. 1, Box 75, Black Mountain, N.C. 28711
Filed Oct. 26, 1987, Ser. No. 112,428
Term of patent 14 years
U.S. Cl. D2—29

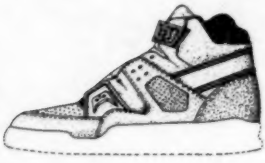


305,377
TRAVEL BIB
Rudy Labatto, and Cathy Labatto, both of 2532 S. Kittredge Way, Aurora, Colo. 80013
Filed Jun. 22, 1987, Ser. No. 64,795
Term of patent 14 years
U.S. Cl. D2—229

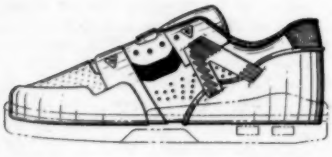
305,378
SHOE HEEL AND COUNTER PROTECTOR
Jill L. Kemna, Bloomington, and Thomas R. Freeman, St. Paul, both of Minn., assignors to Summerfield Industries, Inc., Roseville, Minn.
Filed Jan. 4, 1988, Ser. No. 140,435
Term of patent 14 years
U.S. Cl. D2—277

305,379
SHOE UPPER
Paul D. Brown, Hingham; Judith Ringel, Milton, and David E. Miller, Carver, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,570
Term of patent 14 years
U.S. Cl. D2—314

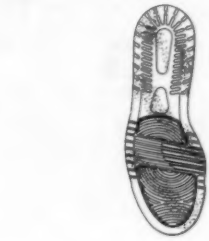




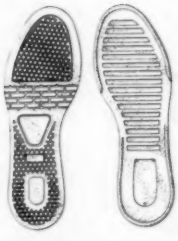
305,380
SHOE UPPER
Ric Claveria, Loma Linda, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Jun. 20, 1989, Ser. No. 369,100
Term of patent 14 years
U.S. Cl. D2—314



305,381
SHOE SOLE
Shigeyuki Mitsui, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 11, 1987, Ser. No. 13,622
Claims priority, application Japan, Aug. 12, 1986, 61-31765
Term of patent 14 years
U.S. Cl. D2—320



305,382
SHOE SOLE
Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 9, 1987, Ser. No. 12,635
Claims priority, application Japan, Aug. 9, 1986, 61-31240
Term of patent 14 years
U.S. Cl. D2—320



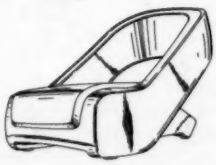
305,383
SHOE SOLE
Takashi Arai, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 6, 1987, Ser. No. 11,848
Claims priority, application Japan, Aug. 6, 1986, 61-30963
Term of patent 14 years
U.S. Cl. D2—320

305,384
SOCK
Robert L. Hubbard, Henderson, N.C., assignor to Americal Corporation, Henderson, N.C.
Filed Jan. 12, 1987, Ser. No. 2,262
Term of patent 14 years
U.S. Cl. D2—331

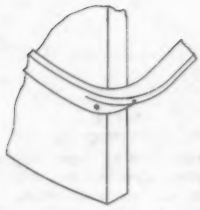
305,385
TOOTHBRUSH
Peter Schneider, Koenigstein, Fed. Rep. of Germany, assignor to Gillette of Canada Inc., Montreal, Canada
Filed Sep. 2, 1988, Ser. No. 240,188
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104

305,386
TOOTHBRUSH
Dieter Rams, Kronberg; Jürgen Greubel, Heidenrod, and Peter Schneider, Koenigstein, all of Fed. Rep. of Germany, assignors to Gillette Canada Inc., Montreal, Canada
Filed Jul. 13, 1987, Ser. No. 69,572
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104

305,387
INFANT BOOSTER CHAIR
James F. Mariol, Cincinnati, Ohio, assignor to Rubbermaid Commercial Products, Winchester, Va.
Filed Jan. 8, 1987, Ser. No. 1,602
Term of patent 14 years
U.S. Cl. D6—333

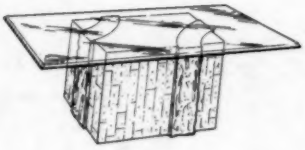


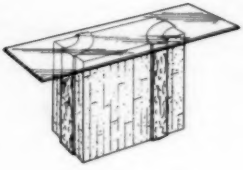
305,388
CANTILEVERED CHAIR
Mark Mascheroni, 37 E. 67th St., New York, N.Y. 10021
Filed May 22, 1986, Ser. No. 866,690
Term of patent 14 years
U.S. Cl. D6—372

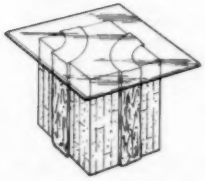


305,389
CHAIR
Mario Bellini, Milan, Italy, assignor to Fehlbaum & Co., Dornach, Switzerland
Filed Jun. 10, 1986, Ser. No. 872,769
Claims priority, application Italy, Jun. 5, 1986, DM/007 027
Term of patent 14 years
U.S. Cl. D6—379

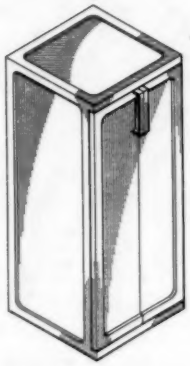
305,390
TABLE
Steven J. Pitchersky, 4509 Kenbridge Dr., Greensboro, N.C. 27410, and Edwin Goldstein, 160 Overlook Ave., Hackensack, N.J. 06041, assignors to Steven J. Pitchersky, Greensboro, N.C. and Edwin Goldstein, Hackensack, N.J.
Filed Apr. 14, 1989, Ser. No. 338,133
Term of patent 14 years
U.S. Cl. D6—451





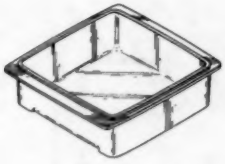


305,391
BATHROOM CABINET
Michael G. Whitney, 10610 Eastview Dr., Orlando, Fla. 32825
Filed Nov. 9, 1987, Ser. No. 118,639
Term of patent 14 years
U.S. Cl. D6—561



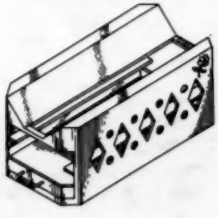
305,392
WINE GLASS OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 24, 1987, Ser. No. 42,003
Term of patent 14 years
U.S. Cl. D7—13

305,393
COMBINED COOKING AND STORAGE CONTAINER
James B. Stewart, Randolph, N.J., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.
Filed Apr. 4, 1986, Ser. No. 847,896
Term of patent 14 years
U.S. Cl. D7—21

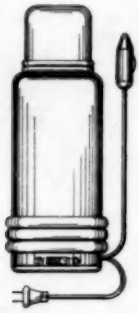


305,394
COMBINED FOOD CONTAINER COVER AND COASTER
Luis F. Puignero, Mallorca St 288, Barcelona, Spain
Filed Nov. 7, 1986, Ser. No. 928,141
Claims priority, application Spain, May 7, 1986, 110553
Term of patent 14 years
U.S. Cl. D7—40

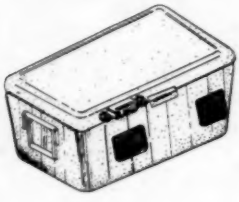
305,395
BOTTLE HOLDER
Charles Steelman, 803 E. 4th St., Denver City, Tex. 79323
Filed Apr. 28, 1986, Ser. No. 857,808
Term of patent 14 years
U.S. Cl. D7—70



305,396
COMBINED FOOD CONTAINER AND HEATING ELEMENT
Mark Weller, 1707 Pittston Ave., Scranton, Pa. 18505
Filed Dec. 3, 1987, Ser. No. 128,501
Term of patent 14 years
U.S. Cl. D7—77

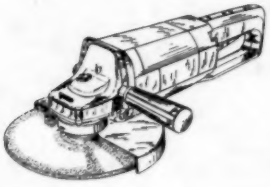


305,397
COMBINED COOLER CHEST AND RADIO
Mark A. Balius, 299 Forrest Ave., Biloxi, Miss. 39530
Filed Jul. 30, 1987, Ser. No. 79,784
Term of patent 14 years
U.S. Cl. D7—77



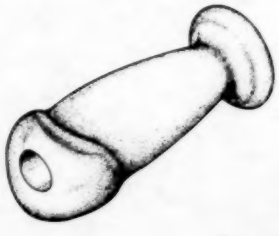
305,398
STAPLER
Paul Olesen, Bellmore, N.Y., assignor to Swingline Inc., Long Island City, N.Y.
Filed Jan. 31, 1986, Ser. No. 823,086
Term of patent 14 years
U.S. Cl. D8—49

305,399
ELECTRIC DISC GRINDER
Fusao Fushiya, and Hirokazu Kimata, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Aug. 19, 1987, Ser. No. 86,838
Claims priority, application Japan, Feb. 24, 1987, 62-6861
Term of patent 14 years
U.S. Cl. D8—62

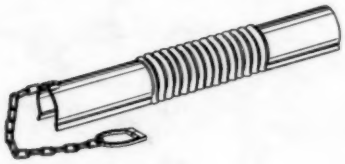


305,400
HAND HELD SANDER
Richard L. Petrovich, 6413 Fordwick Rd., Parma Hts., Ohio 44130
Continuation of Ser. No. 845,549, Mar. 28, 1986. This application Sep. 4, 1987, Ser. No. 93,395
Term of patent 14 years
U.S. Cl. D8—90

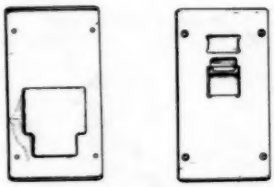
305,401
ANATOMICAL HANDGRIP
Steven A. Winston, Westlake Village, Calif., assignor to Guardian Products, Inc., Arleta, Calif.
Filed Jul. 31, 1987, Ser. No. 81,433
Term of patent 14 years
U.S. Cl. D8—303



305,402
CLAMP FOR HOLDING A TOWEL OR THE LIKE ON A BAR
David M. Novak, 1894 Commercenter, Ste. 201, P.O. Box 5865, San Bernardino, Calif. 92412
Filed Nov. 13, 1987, Ser. No. 119,989
Term of patent 14 years
U.S. Cl. D8—395



305,403
COMBINED RESCUE DOOR STOP AND STRIKER PLATE
Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.
Filed Feb. 3, 1987, Ser. No. 10,315
Term of patent 14 years
U.S. Cl. D8—402



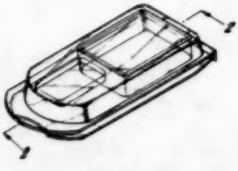
305,404
PERFUME CONTAINER
Alain-Dominique Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed Jul. 15, 1987, Ser. No. 73,429
Claims priority, application France, Jan. 16, 1987, 87 0191
Term of patent 14 years
U.S. Cl. D9—310

305,405
EGG CARTON
Ian G. Wilkinson, Ashwell, Nr. Baldock, Hertfordshire, England, assignor to Ovotherm Verpackungsproduktions, Wr. Neudorf, Austria
Filed Nov. 14, 1986, Ser. No. 930,555
Term of patent 14 years
U.S. Cl. D9—345

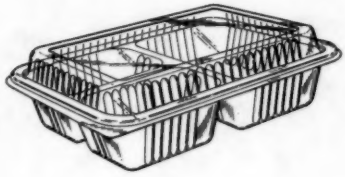
305,406
BOTTLE
Matteo Thune, Milan, Italy, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
Filed Aug. 27, 1986, Ser. No. 901,023
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 8 MR 928
Term of patent 14 years
U.S. Cl. D9—373

305,407
COMBINED DISPENSING BOTTLE AND CAP
Frank E. Gonda, Fairfield, Conn., assignor to Lever Brothers Company, New York, N.Y.
Filed Jan. 21, 1986, Ser. No. 821,172
Term of patent 14 years
U.S. Cl. D9—376

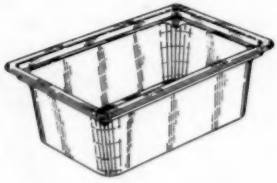
305,408
CLAM SHELL PACKAGE
Aldran H. LaJoie, El Toro, Calif., assignor to Conmar Corporation, Huntington Beach, Calif.
Filed Mar. 31, 1986, Ser. No. 847,547
Term of patent 14 years
U.S. Cl. D9—415



305,409
TRAY WITH COVER
John T. Michaud, Moraga, and Harvey Hum, San Francisco, both of Calif., assignors to Packaging Corporation of America, Evanston, Ill.
Filed Aug. 26, 1986, Ser. No. 900,476
Term of patent 14 years
U.S. Cl. D9—425



305,410
PACKAGING CONTAINER
Frank S. Tyler, Sevenoaks, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Mar. 2, 1987, Ser. No. 20,824
Claims priority, application United Kingdom, Sep. 2, 1986, 1036466
Term of patent 14 years
U.S. Cl. D9—425

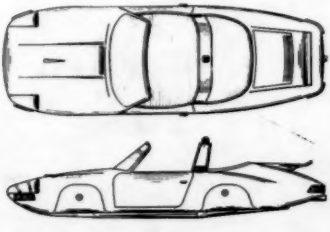


305,411
COMBINED WRISTWATCH AND GUARD THEREFOR
Takashi Atagi, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 29, 1986, Ser. No. 947,508
Term of patent 14 years
U.S. Cl. D10—31

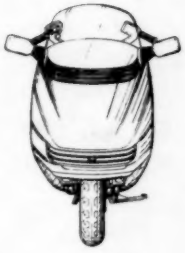
305,412
JEWELRY CLASP
Jack D. Zemer, 550 South Hill, Ste. 891, Los Angeles, Calif. 90013
Filed Jun. 13, 1986, Ser. No. 874,356
Term of patent 14 years
U.S. Cl. D11—87

305,413
NECKTIE RESTRAINT
Joseph G. Martinus, 6020 N. Navarre St., Chicago, Ill. 60631
Filed Jan. 20, 1987, Ser. No. 5,573
Term of patent 14 years
U.S. Cl. D11—202

305,414
AMPHIBIOUS ROAD VEHICLE
Brian K. Costello, 7 Smith Rd., Colchester, Vt. 05446
Filed Jul. 20, 1987, Ser. No. 75,319
Term of patent 14 years
U.S. Cl. D12—3

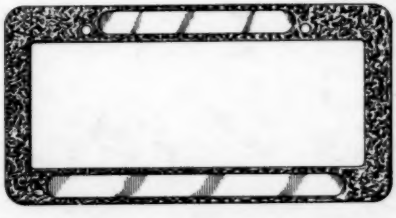


305,415
MOTORCYCLE
Takeo Miura; Kiyoshi Takagi, and Seiji Higashihara, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 13, 1987, Ser. No. 72,624
Claims priority, application Japan, Jan. 14, 1987, 62-956
Term of patent 14 years
U.S. Cl. D12—110

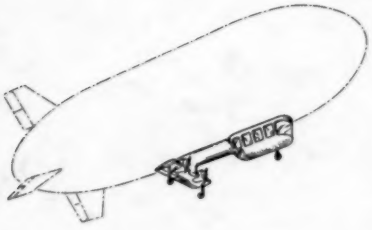


305,416
BABY WALKER'S SEAT COVER
Samuel E. Rohrer, Elverson, and Ronald R. Hoffman, Morgantown, both of Pa., assignors to Graco Children's Products, Elverson, Pa.
Filed Sep. 30, 1987, Ser. No. 103,577
Term of patent 14 years
U.S. Cl. D12—133

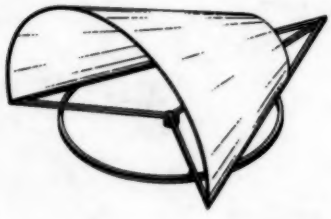
305,417
LICENSE PLATE FRAME
John L. Corey, 17700 S. Avalon Blvd. #55, Carson, Calif. 90746
Filed Apr. 4, 1988, Ser. No. 177,035
Term of patent 14 years
U.S. Cl. D12—193



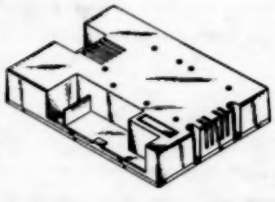
305,418
GONDOLA FOR AN AIRSHIP
Bruce N. Blake, Kensington, Australia, assignor to Airship Developments Australia Pty. Ltd., Victoria, Australia
Filed Dec. 20, 1987, Ser. No. 139,879
Term of patent 14 years
U.S. Cl. D12—345



305,419
ROTATING WIND GENERATOR
Michael Korneski, 13075 Hilary Path, Hastings, Minn. 55033
Filed Sep. 29, 1987, Ser. No. 102,604
Term of patent 14 years
U.S. Cl. D13—3



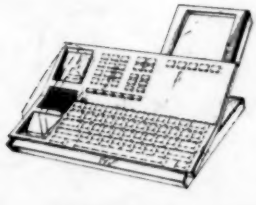
305,420
ELECTRONIC CONTROL MODULE COVER
Walter E. Bujak, Jr., Winsor Locks, Conn., and Robert W. Peitz, Jr., Fayetteville, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 2, 1987, Ser. No. 128,539
Term of patent 14 years
U.S. Cl. D13—12



305,421
CONDUCTOR STRIP FOR ELECTRICAL AND TELECOMMUNICATION CONDUCTORS
Harald Widell, Kalendervägen 25; Jan Widell, Augustivägen 11, and Nils-Åke Bergman, Juniväigen 24, all of S-352 47 Växjö, Sweden
Filed Jun. 18, 1986, Ser. No. 876,368
Claims priority, application Sweden, Dec. 23, 1985, 853143
Term of patent 14 years
U.S. Cl. D13—13

305,422
THREE KEYPAD PUSHBUTTON SET FOR TELECOMMUNICATIONS INSTRUMENTS
David J. Steer, Lincoln; Steven Hawker, Arnold, and Leonard Colebourne, Nottingham, all of England, assignors to Plessey Overseas Limited, Ilford, United Kingdom
Filed Oct. 22, 1986, Ser. No. 922,986
Claims priority, application United Kingdom, Apr. 22, 1986, 1033655
Term of patent 14 years
U.S. Cl. D14—247

305,423
COMMUNICATIONS WORKSTATION
Arthur H. Gilmore; Chris G. Johnson, both of New York, N.Y.; Norman W. Petty, Boulder, Colo.; Barbara A. Seelye, Arvada, Colo., and Thomas J. Tierney, Jr., Aurora, Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Apr. 8, 1987, Ser. No. 35,942
Term of patent 14 years
U.S. Cl. D14—101



305,424

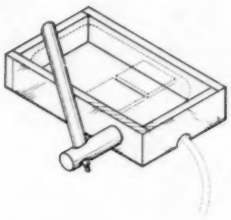
COMBINATION DRAWING PEN AND ENCLOSURF FOR A COMPUTER MOUSE FOR GENERATING FREE HAND COMPUTER GRAPHICS

Leonard E. Pressley, Sr., 6801-19 Space 269, Lubbock, Tex. 79407

Filed Sep. 14, 1987, Ser. No. 96,325

Term of patent 14 years

U.S. Cl. D14—114



305,425

FACSIMILE

Kunio Hara, Chiba, and Shin-ichi Hiroki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 137,002

Claims priority, application Japan, Jun. 25, 1987, 62-25628; Jun. 25, 1987, 62-25629

Term of patent 14 years

U.S. Cl. D14—118

305,426

PORTABLE STILL VIDEO TRANSMITTER

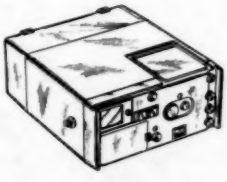
Susumu Doi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1987, Ser. No. 110,499

Claims priority, application Japan, Apr. 27, 1987, 62-16687

Term of patent 14 years

U.S. Cl. D14—124



305,427

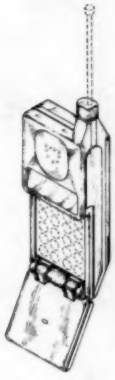
HOUSING FOR A PORTABLE HANDSET TELEPHONE OR SIMILAR ARTICLE

Leonid Soren, Lincolnwood, and Albert L. Nagele, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 11, 1988, Ser. No. 255,696

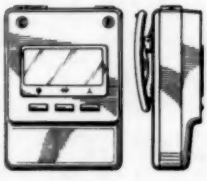
Term of patent 14 years

U.S. Cl. D14—138

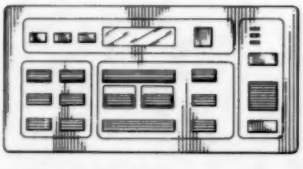


305,428
RADIO PAGER
Jan Berkheij, Driebergen, Netherlands, assignor to Ericsson Paging Systems B.V., Emmen, Netherlands
Filed Jun. 2, 1987, Ser. No. 56,681
Claims priority, application Int'l Pat. Institute, Dec. 3, 1986, DM/007869
Term of patent 14 years
U.S. Cl. D14—191

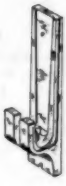
305,429
RADIO PAGER
Jan Berkheij, Driebergen, Netherlands, assignor to Ericsson Paging Systems B.V., Emmen, Netherlands
Filed Jun. 2, 1987, Ser. No. 56,683
Claims priority, application Int'l Pat. Institute, Dec. 3, 1986, DM/007869
Term of patent 14 years
U.S. Cl. D14—191

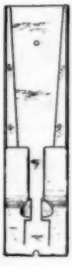


305,430
SURFACE FOR A FRONT PANEL FOR A VIDEO EDITING CONTROLLER
Robert A. Cohen, 29901 Weatherwood Ave., Laguna Niguel, Calif. 92677
Filed Nov. 14, 1986, Ser. No. 931,173
Term of patent 14 years
U.S. Cl. D14—257

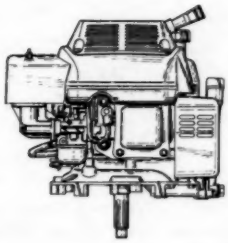


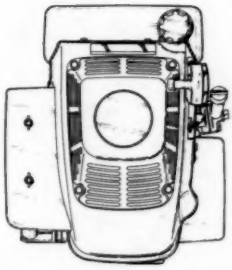
305,431
DOUBLE HOOK FOR A WALL
William E. Adams, Portersville, Pa., assignor to Adams Mfg., Portersville, Pa.
Filed May 26, 1987, Ser. No. 54,279
Term of patent 14 years
U.S. Cl. D8—367



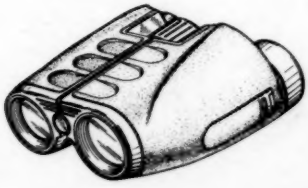


305,432
INTERNAL COMBUSTION ENGINE
Yasunori Hashigaki, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan
Filed Jun. 27, 1988, Ser. No. 214,575
Claims priority, application Japan, Jun. 30, 1987, 62-26889
Term of patent 14 years
U.S. Cl. D15—1



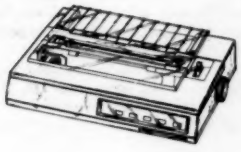


305,433
BINOCULARS
Hiroshi Kobayashi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Mar. 29, 1988, Ser. No. 174,680
Claims priority, application Japan, Oct. 27, 1987, 62-43849
Term of patent 14 years
U.S. Cl. D16—133

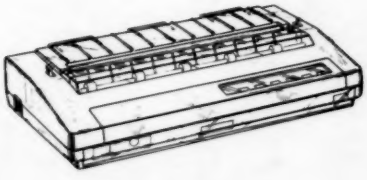


305,434
ELECTRONIC HARP
Ralph F. Garritano, P.O. Box 923, Crystal Beach, Fla. 34681
Filed Dec. 18, 1986, Ser. No. 943,160
Term of patent 14 years
U.S. Cl. D17—16

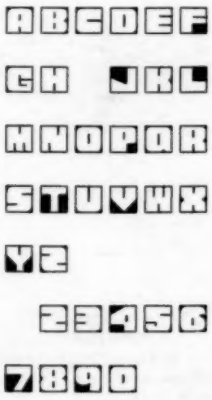
305,435
PRINTER
Seiichi Omino, Tokyo; Atsushi Noda, Kawasaki, and Soichi Hiramatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1986, Ser. No. 867,291
Claims priority, application Japan, Nov. 28, 1985, 60-49702
Term of patent 14 years
U.S. Cl. D18—13



305,436
PRINTER
Eiichi Yoshioka, Abiko, and Koji Terasawa, Mitaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 26, 1986, Ser. No. 935,554
Claims priority, application Japan, May 30, 1986, 61-20803
Term of patent 14 years
U.S. Cl. D18—13



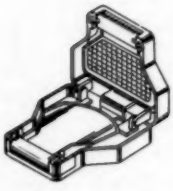
305,437
FONT OF TYPE
Leonard W. Wendling, #161 River Forest Village, Punta Gorda, Fla. 33950
Filed Mar. 6, 1989, Ser. No. 318,947
Term of patent 14 years
U.S. Cl. D18—34



305,438
PORTABLE COPYING MACHINE
Isshin Miyamoto, Fukuoka, and Koji Imaizumi, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Pisu Corporation, both of Osaka, Japan
Filed Sep. 11, 1986, Ser. No. 906,780
Claims priority, application Japan, Mar. 14, 1986, 61-9193
Term of patent 14 years
U.S. Cl. D18—36

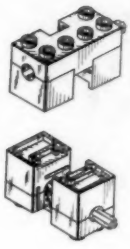
305,439
CARD
Kevin F. Spendler, Ashwood, Australia, assignor to Designcorp Australia Pty. Limited, St. Kilda, Australia
Filed Sep. 29, 1986, Ser. No. 912,552
Claims priority, application Australia, Jan. 24, 1986, 3977/86
Term of patent 14 years
U.S. Cl. D19—1

305,440
SIMULATIVE TOY TOOL
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,550
Term of patent 14 years
U.S. Cl. D21—59



305,441
COMBINED TOY BALLOON AND STUFFER
Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240
Filed Nov. 23, 1987, Ser. No. 124,462
Term of patent 14 years
U.S. Cl. D21—84

305,442
TOY BUILDING LIFT ELEMENT
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Switzerland
Filed May 26, 1987, Ser. No. 54,367
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, URA 1526/86
Term of patent 14 years
U.S. Cl. D21—108

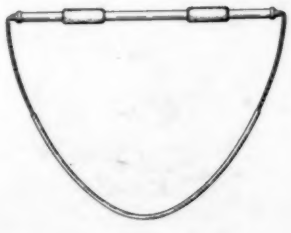


305,443
JUMP MARBLE RACE TOY
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Jul. 1, 1988, Ser. No. 214,697
Term of patent 14 years
U.S. Cl. D21—143

305,444
GRANDMA DOLL
Arvid Strohschein, 831 Birch St., Sauk Centre, Minn. 56378
Filed Sep. 3, 1985, Ser. No. 772,024
Term of patent 14 years
U.S. Cl. D21—175

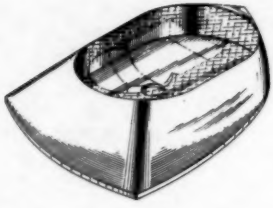
305,445
PHYSICAL EXERCISER
Raymond Ramos, Jr., 820 Raywood, Montebello, Calif. 90640
Filed Jul. 6, 1987, Ser. No. 69,623
Term of patent 14 years
U.S. Cl. D21—191

305,446
JUMPROPE
Thomas Valentine, Sherman Oaks, Calif., assignor to Apogee, Inc., Van Nuys, Calif.
Filed Dec. 21, 1987, Ser. No. 136,644
Term of patent 14 years
U.S. Cl. D21—198

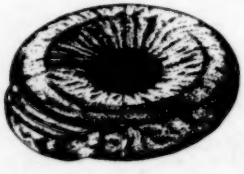


305,447
JUMPROPE
Thomas Valentine, Sherman Oaks, Calif., assignor to Apogee, Inc., Van Nuys, Calif.
Filed Dec. 21, 1987, Ser. No. 136,181
Term of patent 14 years
U.S. Cl. D21—198

305,448
KICKING TEE BASE
H. Jay Spiegel, 2112 Whiteoaks Dr., Alexandria, Va. 22306
Filed Jan. 7, 1987, Ser. No. 1,110
Term of patent 14 years
U.S. Cl. D21—209

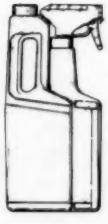


305,449
FLOAT
Peter A. Rundquist, Jr., Atlanta, Ga., assignor to Anton Discovery Group, Inc., Atlanta, Ga.
Filed Jun. 19, 1987, Ser. No. 64,296
Term of patent 14 years
U.S. Cl. D21—237



305,450
COMBINED FISHING POLE, NIGHT LIGHT AND BITE INDICATOR LIGHT
Jack B. Noble, and Barbara A. Noble, both of 202 Macdill Ct., Lackland AFB, San Antonio, Tex. 78236
Filed Oct. 2, 1986, Ser. No. 914,757
Term of patent 14 years
U.S. Cl. D22—142

305,451
COMBINED SPRAYER AND REFILL CONTAINER
Robert S. Rosenbaum, Los Angeles, Calif., assignor to Mission Kleensweep Products, Inc., Los Angeles, Calif.
Filed Jul. 31, 1987, Ser. No. 79,888
Term of patent 14 years
U.S. Cl. D23—225

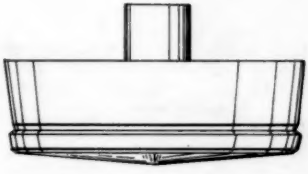


305,452
SPRAY GUN UNIT
Fredrick M. Morgan, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio
Filed Oct. 30, 1987, Ser. No. 116,135
Term of patent 14 years
U.S. Cl. D23—225

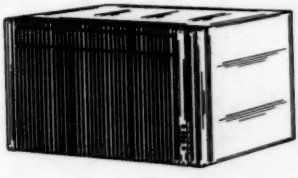
305,453
SPRAY GUN
Fredrick M. Morgan, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio
Filed Oct. 30, 1987, Ser. No. 116,120
Term of patent 14 years
U.S. Cl. D23—226

305,454
HOSE END TRIGGER NOZZLE
Craig E. Beal, Vistas, Calif., assignor to Rain Bird Consumer Products Mfg. Corp, Glendora, Calif.
Filed Nov. 27, 1987, Ser. No. 126,301
Term of patent 14 years
U.S. Cl. D23—226

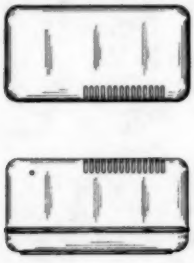
305,455
COMBINED BATHTUB OVERFLOW DRAIN COVER AND DRAIN CONTROL HANDLE
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Apr. 6, 1987, Ser. No. 34,186
Term of patent 14 years
U.S. Cl. D23—254



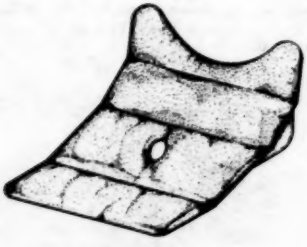
305,456
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,074
Claims priority, application Japan, May 29, 1987, 62-22489
Term of patent 14 years
U.S. Cl. D23—353



305,457
DEODORIZER
Kaname Nakao, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 9, 1988, Ser. No. 192,309
Claims priority, application Japan, Nov. 10, 1987, 62-45840
Term of patent 14 years
U.S. Cl. D23—366

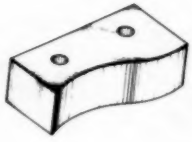


305,458
MASSAGE CUSHION OR SIMILAR ARTICLE
Austin Wang, 6F, No. 24, Ting-Mu E. Road, Tnipei, Taiwan
Filed Jun. 1, 1987, Ser. No. 26,162
Term of patent 14 years
U.S. Cl. D24—40

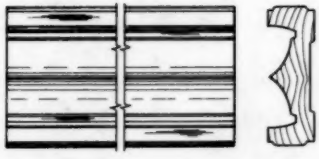


305,459
FEEDING NIPPLE
Lois G. Smith, 4046 E. Harley, Tucson, Ariz. 85712
Filed Jun. 12, 1987, Ser. No. 61,175
Term of patent 14 years
U.S. Cl. D24—46

305,460
BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 38,891
Claims priority, application Japan, Oct. 15, 1986, 61-40558
Term of patent 14 years
U.S. Cl. D25—114



305,461
MOLDING
Charles V. Pike, 309 Via Linda, Palm Beach, Fla. 33408
Filed Jun. 15, 1987, Ser. No. 62,051
Term of patent 14 years
U.S. Cl. D25—136



305,462
CIGARETTE LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed Jun. 23, 1987, Ser. No. 65,523
Claims priority, application Japan, Dec. 24, 1986, 61-50781
Term of patent 14 years
U.S. Cl. D27—156

305,463
COSMETIC SAMPLER
Linda Zango, 1160 Fifth Ave., Ste. 610, New York, N.Y. 10029
Filed Jun. 15, 1987, Ser. No. 63,271
Term of patent 14 years
U.S. Cl. D28—7

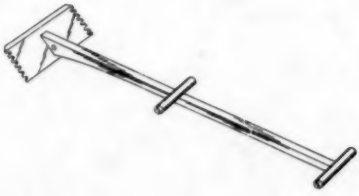
305,464
BLOW DRYER
Lee Rickard, and Peggy Rickard, both of Rte. 15, Box 808-D, N. Ft. Myers, Fla. 33917
Filed Dec. 3, 1987, Ser. No. 128,502
Term of patent 14 years
U.S. Cl. D28—12

305,465
SAFETY RAZOR OR THE LIKE
Oneta R. Hayes, 533 E. 5th, Claremore, Okla. 74107
Filed Aug. 11, 1986, Ser. No. 895,266
Term of patent 14 years
U.S. Cl. D28—46

305,466
ELECTRIC MOUSTACHE AND BEARD TRIMMER OR SIMILAR ARTICLE
Teizoh Satoh, Osaka, Japan, assignor to Helen of Troy Corporation, El Paso, Tex.
Filed May 24, 1988, Ser. No. 202,574
Term of patent 14 years
U.S. Cl. D28—53

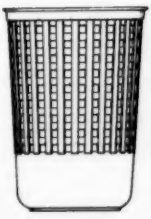
305,467
BUCKET
David L. Dagge, Luton, United Kingdom, assignor to Addis Limited, Hertfordshire, United Kingdom
Filed Dec. 10, 1987, Ser. No. 131,173
Claims priority, application United Kingdom, Jun. 16, 1987, 1042855
Term of patent 14 years
U.S. Cl. D32—53

305,468
COMBINED SNOW AND ICE REMOVER AND SCRAPER
Edward H. Yonkers, 13 Cooney St., Somerville, Mass. 02143
Filed Dec. 27, 1985, Ser. No. 813,710
Term of patent 14 years
U.S. Cl. D32—49

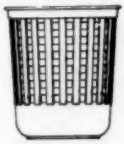


305,469
COMBINED BASKET AND REMOVABLE LINER
Sarah M. Mautner, 703 S. Main St., Auburn, Ind. 46706
Filed Jul. 6, 1987, Ser. No. 70,231
Term of patent 14 years
U.S. Cl. D34—40

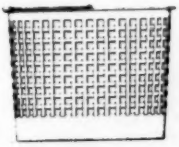
305,470
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Jun. 2, 1986, Ser. No. 869,941
Claims priority, application Japan, Dec. 17, 1985, 60-52716
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—40



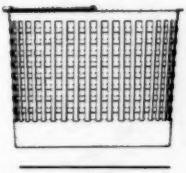
305,471
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Jun. 2, 1986, Ser. No. 869,940
Claims priority, application Japan, Dec. 17, 1985, 60-52717
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—40



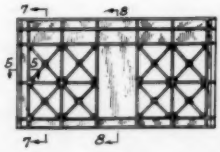
305,472
BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Sep. 23, 1986, Ser. No. 910,776
Claims priority, application Japan, May 8, 1986, 61-17255
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—42



305,473
BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Sep. 23, 1986, Ser. No. 910,742
Claims priority, application Japan, Apr. 28, 1986, 16117/1986
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—42



305,474
ORNAMENTAL CASE
Orlando O. Fresquez, 9549 Markwood Dr., Santee, Calif. 92071
Filed Dec. 1, 1987, Ser. No. 127,098
Term of patent 14 years
U.S. Cl. D34—45



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JANUARY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.R.I.S.S.p.A.: *See—*
Peretti, Claudio; and Rebuffatti, Guglielmo, 4,892,268, Cl. 244-3.100.

AB ASEA-Atom: *See—*
Janzen, Erik; and Tenghamn, Rune, 4,893,354, Cl. 455-612.000.

AB Electrolux: *See—*
Schwartz, Osten, 4,893,037, Cl. 310-68.00B.

Abbott Laboratories: *See—*
Homandberg, Gene A.; and Wai, Thanda, 4,892,826, Cl. 435-183.000.

Abdelrahman, Abdelrahman A., to Continental Baking Company. Reduced calorie high fiber bread containing a treated soy polysaccharide material. 4,892,762, Cl. 426-549.000.

Abe, Kazunobu; and Umaba, Toshikatsu, to Sakai Chemical Industry Co., Ltd. Molded catalyst and method of catalytic gas reactions using the same. 4,892,716, Cl. 423-213.700.

Abe, Yoshikazu: *See—*
Taguchi, Tatsuhisa; and Abe, Yoshikazu, 4,892,466, Cl. 417-295.000.

Abel, Alan D.: *See—*
Schmidt, William P.; Kumar, Ravi; and Abel, Alan D., 4,892,565, Cl. 55-26.000.

Abou-Gharbia, Magid A., to American Home Products Corporation. Fused bicyclic imides with psychotropic activity. 4,892,943, Cl. 540-575.000.

Abramowicz, Daniel A.; and Keese, Charles R., to General Electric Company. Enzyme-catalyzed reactions involving diphenyl carbonate. 4,892,822, Cl. 435-132.000.

Abtahi, Nooral S. Portable apparatus for refrigerated storage and transportation of cosmetics and the like. 4,892,226, Cl. 220-412.000.

Access Corporation: *See—*
Pitts, W. Hampton; and Thomas, Ronald G., 4,893,248, Cl. 364-464.010.

Acheson, Rees. Automatic welding apparatus for weld build-up and method of achieving weld build-up. 4,892,990, Cl. 219-76.140.

Achterwinter, Norbert; and Hax, Wolfgang, to Reifenhauser GmbH & Co. Maschinenfabrik. Lowering mechanism for the foil in a device for winding-up a foil web, particularly a synthetic-material foil web. 4,892,264, Cl. 242-58.600.

Ackerman, David A.; and Koszi, Louis A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Article comprising an opto-electronic device and an optical waveguide coupled thereto, and method of making the article. 4,892,374, Cl. 350-96.150.

Adachi, Hitoshi: *See—*
Ito, Meiichi; Kuriyagawa, Kazuya; Adachi, Hitoshi; and Ohno, Kohei, 4,892,104, Cl. 128-697.000.

Adamik, John A.: *See—*
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,892,753, Cl. 427-38.000.

Adams, Richard P.: *See—*
Dixit, Nagaraj S.; Rhinesmith, Robert J.; Sullivan, James J.; Barone, Cynthia A.; Adams, Richard P.; and Lai, Kuo-Yann, 4,892,673, Cl. 252-114.000.

Adhya, Sankar: *See—*
Pastan, Ira H.; Adhya, Sankar; and Fitzgerald, David, 4,892,827, Cl. 435-193.000.

Adolph Coors Company: *See—*
Dorfman, Jan L.; Cook, Harold, Jr.; and Moen, Bruce A., 4,892,209, Cl. 215-277.000.

Adolph Motors COmpany: *See—*
Thomas, David A.; Karr, Robert F.; and Davies, Patricia K., 4,892,412, Cl. 366-145.000.

Advanced Cardiovascular Systems, Inc.: *See—*
Songer, Ronald W.; and McInnes, Peter R., 4,892,519, Cl. 604-96.000.

Advanced Micro Devices, Inc.: *See—*
Cheung, Robin W.; Ho, Bernard W. K.; Chen, Hsiang-Wen; and Chan, Hugo W. K., 4,892,844, Cl. 437-194.000.
Rahman, Mahboob F.; Parikh, Dakshesh D.; Daly, Marita E.; and Wang, Bu-Chin, 4,893,279, Cl. 365-230.030.

Aebischer, Patrick; Winn, Shelley R.; and Galletti, Pierre M., to Brown University Research Foundation. In vivo delivery of neurotransmitters by implanted, encapsulated cells. 4,892,538, Cl. 604-891.100.

Aeroquip Corporation: *See—*
Spalink, Robert D.; Knowles, Steven M.; and Kusztowny, John T., 4,892,117, Cl. 137-614.030.

Aerospatiale Societe Nationale Industrielle: *See—*
Barbier, Bruno J. M.; and Michaud-Soret, Jean A., 4,892,462, Cl. 416-226.000.

Aframian, Mousa, to White Consolidated Industries, Inc. Mounting for electrical control. 4,892,987, Cl. 200-296.000.

AG Communications Systems Corporation: *See—*
Kollanyi, Miklos J., 4,893,002, Cl. 250-214.00R.

Agano, Toshitaka; Furue, Ryousuke; Karasawa, Hiroyuki; and Miyagawa, Ichirou, to Fuji Photo Film Co., Ltd. Radiation image read-out and reproducing apparatus. 4,893,012, Cl. 250-327.200.

Agarwala, Ashok K., to Eastman Kodak Company. Electric machinery employing a superconductor element. 4,892,863, Cl. 505-1.000.

Agency of Industrial Science and Technology: *See—*
Tanaka, Masato; and Sakakura, Toshiyasu, 4,892,936, Cl. 534-595.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,892,678, Cl. 252-500.000.

Agfa-Gevaert AG: *See—*
Bauer, Walter; Muller, Jurgen; and Voigtlander, Volkmar, 4,893,011, Cl. 250-327.200.

Agfa-Gevaert, N.V.: *See—*
Bollen, Romain H.; and Florens, Raymond L., 4,893,021, Cl. 250-487.100.
Van Cappellen, Jan B.; De Groot, Luc M.; Vancoppenolle, Gery; Vandenbrande, Daniel G.; and De Keyzer, Jan K., 4,892,689, Cl. 264-25.000.

Ahlstrand, Ove: *See—*
Bjornberg, Sten; and Ahlstrand, Ove, 4,892,535, Cl. 604-380.000.

Ahn, Chul H. Door viewer. 4,892,399, Cl. 350-569.000.

Aiba, Shintaro: *See—*
Ohkubo, Isao; and Aiba, Shintaro, 4,893,001, Cl. 235-490.000.

Aigner, Friedrich, to Steyr-Daimler-Puch AG. Hand-held automatic firearm. 4,892,026, Cl. 89-140.000.

Aihara, Yasuyuki: *See—*
Tsuchiya, Yoshikazu; Kano, Hideki; Aihara, Yasuyuki; Miyazaki, Noboru; Suzuki, Izumi; and Ichida, Kiyofumi, 4,892,490, Cl. 439-533.000.

Ainsworth, Robert D.; Devanathan, Thirumalai N. C.; and Lin, Steven T. C. Orthopedic device. 4,892,552, Cl. 623-23.000.

Air Products and Chemicals, Inc.: *See—*
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,892,974, Cl. 564-409.000.
Miller, Michael B.; and Bertin, Robert D., 4,892,788, Cl. 428-336.000.
Quay, Jeffrey R.; and Casey, Jeremiah P., 4,892,920, Cl. 528-61.000.
Schmidt, William P.; Kumar, Ravi; and Abel, Alan D., 4,892,565, Cl. 55-26.000.

AirSep Corporation: *See—*
Bansal, Ravinder K.; and Vrana, Edward E., 4,892,566, Cl. 55-26.000.

Aisin Seiki,Co. Ltd.: *See—*
Suzuki, Saburo; Terada, Takami; and Yamazaki, Masayuki, 4,892,282, Cl. 248-430.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Ishibashi, Kiyoshi, 4,891,951, Cl. 62-51.300.
Nakao, Hirotake, 4,891,909, Cl. 49-391.000.
Nishii, Michiharu; and Tada, Yoshihiko, 4,892,361, Cl. 303-114.000.
Soichi, Hara; and Kageyama, Hiroshi, 4,891,875, Cl. 29-156.50R.
Tateishi, Yosuke, 4,892,985, Cl. 200-83.00N.
Turner, Alan B.; Kondo, Toshiyuki; and Mori, Katsuhiro, 4,893,040, Cl. 310-156.000.

Aisin-Warner Kabushiki Kaisha: *See—*
Nishida, Masaaki; and Hayakawa, Youichi, 4,892,011, Cl. 74-761.000.

Aizawa, Reize: *See—*
Mizuno, Koichi; Saito, Masahiro; Takahashi, Tadao; and Aizawa, Reize, 4,892,855, Cl. 502-200.000.

Ajinomoto Co., Inc.: *See—*
Sakurai, Takao; Yokota, Tadahiko; Komatsu, Eri; Mikami, Naoko; Higuchi, Ryoichi; and Takeuchi, Koji, 4,892,676, Cl. 252-299.610.

Akebono Brake Industry Co., Ltd.: *See—*
Maehara, Toshifumi, 4,892,468, Cl. 417-415.000.

Akebono Research, Development Centre Ltd.: *See—*
Maehara, Toshifumi, 4,892,468, Cl. 417-415.000.

Akeel, Hadi A.; McClosky, Stan H.; and Najdovski, Lupcho, to GMF Robotics Corporation. Industrial laser robot system. 4,892,992, Cl. 219-121.780.

Akers, Scott R.: *See—*
Cocks, Franklin H.; and Akers, Scott R., 4,892,089, Cl. 128-24.00A.

Akiba, Tetsunori; and Matsunaga, Kuniyoshi, to Amano Pharmaceutical Co., Ltd. Method for the determination of cholesterol. 4,892,816, Cl. 435-11.000.

Akiyama, Eitetsu: *See*—
Kishi, Noriyuki; Kuboders, Masao; and Akiyama, Eitetsu, 4,891,947, Cl. 60-602.000.

Akiyama, Koji: *See*—
Iwaoka, Hideto; Ohte, Akira; and Akiyama, Koji, 4,893,353, Cl. 455-612.000.

Aktiebolaget Tetra Pak: *See*—
Gustafsson, Bror, 4,892,182, Cl. 198-454.000.

Akzo America Inc.: *See*—
Mehaffey, Joseph L.; and Newman, Thomas C., 4,892,649, Cl. 209-166.000.

Alas, Jacques: *See*—
Nandin, Jacky; and Alas, Jacques, 4,892,008, Cl. 74-574.000.

Albouy, Pierre: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Antonio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, 4,893,309, Cl. 370-110.100.

Albrektsson, Tomas: *See*—
Miller, Josef M.; Pfingst, Bryan E.; Tjellstrom, Anders; and Albrektsson, Tomas, 4,892,108, Cl. 128-784.000.

Albright, Jay D.; Powell, Dennis W.; and Dusza, John P., to American Cyanamid Company. N-substituted -N-(3-(1,2,4-triazolo-(4,3-b)pyridazin-6-yl)phenyl)alkanamides, carbamates and ureas. 4,892,873, Cl. 514-248.000.

Albring, Manfred: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,892,867, Cl. 514-178.000.

Alcan International Limited: *See*—
Marwick, William F., 4,892,599, Cl. 156-94.000.
Rosch, Fritz; and Otte, Bernd, 4,892,069, Cl. 123-193.0CH.

Alessio, Walter. Collar for fastening pipes, cables, rods and the like. 4,892,276, Cl. 248-74.100.

Alfred Teves GmbH: *See*—
Becker, Horst-Peter, 4,891,945, Cl. 60-547.100.
Burgdorf, Jochen, 4,892,363, Cl. 303-116.000.
Burgdorf, Jochen, 4,892,364, Cl. 303-116.000.
Wagner, Wilfried; and Schiel, Lothar, 4,892,027, Cl. 91-369.200.

Alig, Leo; and Muller, Marcel, to Hoffman-La Roche Inc. Phenoxypropanolamines. 4,892,886, Cl. 514-567.000.

Alker, David; Campbell, Simon F.; and Cross, Peter E., to Pfizer Inc. Dihydropyridine anti-ischaemic and antihypertensive agents. 4,892,881, Cl. 514-356.000.

Alkor GmbH Kunststoffe: *See*—
Schneider, Manfred; Heitz, Heinrich; Schlenz, Dieter; and Ewald, Egon, 4,892,605, Cl. 156-272.600.

Allec, Josiane: *See*—
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, 4,892,888, Cl. 514-132.000.

Allenbaugh, Dwight. Walk-through scaffolding construction. 4,891,926, Cl. 52-637.000.

Allied Colloids Limited: *See*—
Hawe, Malcolm; and Farrar, David, 4,892,916, Cl. 526-304.000.

Allied Engineering Company S.A.: *See*—
Wollner, Erik, deceased; Wollner, Barbro; and Ennerdal, Leif, 4,892,331, Cl. 280-808.000.

Allied-Signal Inc.: *See*—
Boggs, Beryl A., 4,892,018, Cl. 83-15.000.
Greco, Robert J.; and Betterton, Jack D., 4,892,269, Cl. 244-53.00R.

Alligood, John H.; and Lawther, Joel S., to Eastman Kodak Company. Compact camera providing direct and indirect flash. 4,893,139, Cl. 354-149.100.

Alling, Richard L.: *See*—
Christenson, Carl R.; and Alling, Richard L., 4,892,424, Cl. 384-620.000.

Alonso, Manuel T., to Tascon Medical Technology Corporation. Heart valve prosthesis. 4,892,541, Cl. 623-2.000.

Alperson, Joel H. Retailing display assembly. 4,892,200, Cl. 211-193.000.

Alsup, Mitch K.: *See*—
Denman, Marvin A., Jr.; Young, John M.; and Alsup, Mitch K., 4,893,268, Cl. 364-759.000.

Alsup, Mitchell; Talgam, Yoav; and Denman, Marvin A., to Motorola, Inc. Method and apparatus for a data processor to support multimode, multi-precision integer arithmetic. 4,893,267, Cl. 364-745.000.

Altman Stage Lighting Co., Inc.: *See*—
Solomon, Dennis, 4,893,225, Cl. 362-293.000.

Altus Corporation: *See*—
Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., 4,892,796, Cl. 429-196.000.

Aluminum Company of America: *See*—
Perrotta, Anthony J.; Grubbs, Donald K.; Quayle, William H.; and Gurgiolo, Thomas B., 4,892,693, Cl. 264-108.000.
Ray, Siba P., 4,892,861, Cl. 505-1.000.
Stol, Isreal, 4,892,993, Cl. 219-125.100.

Alupower, Inc.: *See*—
Rao, Bhaskara M. L.; Kobasz, William; and Menke, James C., 4,892,797, Cl. 429-210.000.

ALZA Corporation: *See*—
Theeuwes, Felix; Wong, Patrick S. L.; Cortese, Richard; and Eckenhoff, James B., 4,892,778, Cl. 428-218.000.

AM International, Inc.: *See*—
Kruse, Jurgen M.; and Kimball, Donald, 4,892,787, Cl. 428-331.000.

Amano Pharmaceutical Co., Ltd.: *See*—
Akiba, Tetsunori; and Matsunaga, Kuniyoshi, 4,892,816, Cl. 435-11.000.

Ambi-Rad Limited: *See*—
Fletcher, John E., 4,892,084, Cl. 126-92.0AC.

Amca International Corporation: *See*—
Hey, John E.; Delago, Pierre C.; and Carlson, James A., 4,892,202, Cl. 212-192.000.

American Cyanamid Company: *See*—
Albright, Jay D.; Powell, Dennis W.; and Dusza, John P., 4,892,873, Cl. 514-248.000.
Stockton, Gerald W.; Chidester, Dale H.; and Ehrlich, Susan J., 4,892,707, Cl. 422-51.000.
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Meyer, Walter E., 4,892,885, Cl. 514-478.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A., 4,892,943, Cl. 540-575.000.

American Laser Corporation: *See*—
Chaffee, Edwin G., 4,892,497, Cl. 445-28.000.

American National Can Company: *See*—
Genske, Roger P., 4,892,911, Cl. 525-240.000.
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,892,699, Cl. 264-328.800.

American Science and Engineering, Inc.: *See*—
Kubierschky, Klaus; and Aronson, Herbert L., 4,893,015, Cl. 250-369.000.

American Sterilizer Company: *See*—
Cook, Thomas G.; and Geibel, Conrad J., Jr., 4,891,910, Cl. 49-395.000.

American Suessen Corporation: *See*—
Stahlecker, Peter H., 4,892,422, Cl. 384-549.000.

American Telephone and Telegraph Company: *See*—
Carlin, James W.; Chipaloski, Anthony C.; and Schloss, Robert P., 4,893,300, Cl. 370-3.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Ackerman, David A.; and Koszi, Louis A., 4,892,374, Cl. 350-96.150.
Bates, Frank S.; Hartney, Mark A.; and Novembre, Anthony E., 4,892,617, Cl. 156-659.100.
Beck, Roger P.; Castagno, Daniel L.; Craig, Robert B., Jr.; Davidheiser, Timothy S.; Haley, Allen W., Jr.; Huff, Stanley M.; and Radigan, Russell P., 4,893,270, Cl. 364-900.000.
Fang, Wei-Chou; and Vyas, Brijesh, 4,892,795, Cl. 429-194.000.
Franco, Victor A., 4,893,330, Cl. 379-91.000.
Kornblit, Avinoam, 4,892,635, Cl. 204-192.360.
Miller, Gabriel L., 4,893,071, Cl. 324-660.000.
Wuthnow, Mark S., 4,893,336, Cl. 379-211.000.

Ametek, Inc.: *See*—
Glasheen, Wiliam M., 4,892,381, Cl. 350-96.220.

Amjad, Zahid, to B. F. Goodrich Company, The. Tartar inhibiting oral compositions and method. 4,892,724, Cl. 424-49.000.

Amjad, Zahid, to B. F. Goodrich Company, The. Tartar inhibition on teeth. 4,892,725, Cl. 424-49.000.

Amoco Corporation: *See*—
Nowicki, Neal R.; and Lowry, James D., Jr., 4,892,970, Cl. 22-413.000.
Schroeder, Hobe; and James, David E., 4,892,972, Cl. 562-487.000.

Ampex Corporation: *See*—
Little, Graeme M., 4,893,198, Cl. 360-14.100.

Amphenol Corporation: *See*—
Takeda, Mitsuru; and Mizunuma, Koji, 4,892,379, Cl. 350-96.210.

Amsted Industries Incorporated: *See*—
Spencer, Charles P.; Pitchford, Terry L.; and Radwill, Robert P., 4,892,324, Cl. 280-440.000.

Analog Intelligence Corp.: *See*—
Tomlinson, Max S., Jr., 4,893,255, Cl. 364-513.000.

Andersen, David A.; and Harpe, Richard L., to David Piatt & Associates; and Wescotek, Inc. Low calorie pet treat. 4,892,748, Cl. 426-635.000.

Anderson, Carl, to Anderson-Cook, Inc. Roll forming notches in a thin-wall power transmission member. 4,891,962, Cl. 72-88.000.

Anderson-Cook, Inc.: *See*—
Anderson, Carl, 4,891,962, Cl. 72-88.000.

Anderson, Gary C.: *See*—
Datta, Paul J.; and Anderson, Gary C., 4,892,534, Cl. 604-370.000.

Anderson, Gary J.: *See*—
Bush, James W.; and Anderson, Gary J., 4,893,044, Cl. 310-261.000.

Anderson, J. E. C., to Milbar Corporation. Adjustable socket. 4,892,016, Cl. 81-128.000.

Anderson, Robert E., to Grumman Aerospace Corporation. Interlocking structural members employing transverse locking double interfitting wedge. 4,892,435, Cl. 403-374.000.

Ando, Hisashi: *See*—
Watanabe, Ruyji; Shimizu, Seiki; and Ando, Hisashi, 4,892,986, Cl. 200-144.00B.

Ando, Takumi; Toyomi, Toshitaka; and Osanai, Yasuhiro, to Janome Sewing Machine Company Limited. Sewing machine having apparatus for indicating elongated pattern magnification. 4,892,050, Cl. 112-458.000.

Andoh, Akira, to Mitsubishi Denki Kabushiki Kaisha. Power source control device in car telephone mobile station system. 4,893,348, Cl. 455-89.000.

Andreini, Antonio; Contiero, Claudio; and Galbiati, Paola, to SGS Microelettronica S.p.A. Method for manufacturing semiconductor integrated circuits including CMOS and high-voltage electronic devices. 4,892,836, Cl. 437-29.000.

Andrews, Gerald W.; Dunnigan, William E.; Haselton, E. Fletcher; and Redwood, William J., to Teknekron Infoswitch Corporation. Automatic call distribution (ACD) switching system having distributed processing capability. 4,893,301, Cl. 370-58.200.

Andreyko, Norman J. Wall bracket for mounting an electrical connector. 4,892,212, Cl. 220-3.300.

Anritsu Corporation: *See—*
Wakai, Toshiyuki; and Kashiwabara, Toshiyuki, 4,893,006, Cl. 250-227.000.

Aoki, Kozo; Ono, Michio; and Saito, Naoki, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material containing cyan dye forming coupler. 4,892,810, Cl. 430-553.000.

Aoyagi, Yoshio: *See—*
Endo, Fumio; Kimura, Toshiyuki; and Aoyagi, Yoshio, 4,893,293, Cl. 369-34.000.
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,893,294, Cl. 369-44.000.

Apollo Corporation: *See—*
Kumazawa, Kiyoshi, 4,892,503, Cl. 446-456.000.

Apostolides, John K., to R.P.M. Industries. Multi-stage solenoid with time delayed actuation. 4,893,213, Cl. 361-191.000.

Applied Materials, Inc.: *See—*
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,892,753, Cl. 427-38.000.

Aqualon Company: *See—*
Kirkland, William J.; Lukach, Carl A.; and McLachlan, William C., 4,892,589, Cl. 106-197.100.

Aquatrol Corporation: *See—*
Brown, Richard W., 4,893,332, Cl. 379-97.000.

Aquilina, Anthony G. Pneumatic door opener. 4,891,908, Cl. 49-199.000.

Arai, Akihiro: *See—*
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, 4,893,140, Cl. 354-149.110.

Arai, Kazutaka: *See—*
Nohira, Hiroyuki; Arai, Kazutaka; and Yoshinaga, Kazuo, 4,892,675, Cl. 252-299.010.

Arai, Masatoshi; Satoh, Shinichi; and Fujioka, Kazutoshi, to Shin-Etsu Chemical Co., Ltd. Ultraviolet-curable organopolysiloxane composition. 4,892,895, Cl. 522-99.000.

Arai, Tadashi; Tanaka, Mamoru; and Maeda, Akio, to Tadashi Arai. Biological intestinal antiseptics. 4,892,731, Cl. 424-93.000.

Arai, Tohru; Takeda, Hiromasa; and Kawaura, Hiroyuki. Method for surface treatment. 4,892,759, Cl. 427-249.000.

Arakawa, Yoshiki, to Matsushita Electric Industrial Company, Ltd. Three-dimensional geometry processing method and apparatus therefor. 4,893,260, Cl. 364-564.000.

Arav, Ronnie A., to Harnischfeger Corporation. Hoist swivel support having swivelable surface and bearing inserts. 4,892,203, Cl. 212-221.000.

Arbour, Gaetan: *See—*
Elia, Gerardo P.; Arbour, Gaetan; and Podobnik, Ivan Z., 4,892,473, Cl. 425-197.000.

Arco Chemical Technology, Inc.: *See—*
Le-Khac, Bi, 4,892,533, Cl. 604-368.000.

Ardco, Inc.: *See—*
Bockwinkel, Gerald J., 4,891,912, Cl. 49-484.000.

Ariizumi, Shoji: *See—*
Iwase, Taira; Ariizumi, Shoji; and Masuoka, Fujio, 4,892,841, Cl. 437-52.000.
Suzuki, Youichi; Segawa, Makoto; Ariizumi, Shoji; Kondo, Takeo; and Masuoka, Fujio, 4,893,159, Cl. 357-23.130.

Arita, Eriya: *See—*
Ichihara, Takayuki; Yogo, Takeji; Iinuma, Masuhito; Arita, Eriya; and Yokoo, Haruo, 4,892,136, Cl. 165-51.000.

Armbruster, Veit: *See—*
Maier, Gerhard; and Armbruster, Veit, 4,893,288, Cl. 367-116.000.

Arndt, Friedrich: *See—*
Kruger, Martin; Westermann, Jurgen; Arndt, Friedrich; Rees, Richard; and Hunt, Russel G., 4,892,576, Cl. 71-93.000.

Arndt, Peter J.: *See—*
Klesse, Wolfgang; Rauch, Hubert; Arndt, Peter J.; and Suetterlin, Norbert, 4,892,910, Cl. 525-221.000.
Rauch, Hubert; and Arndt, Peter J., 4,892,932, Cl. 528-499.000.

Arnold, Aaron L., to Northern Telecom Limited. Illumination devices for inspection systems. 4,893,223, Cl. 362-252.000.

Arnold, Fred E.; and Burkett, Jerry L., to United States of America, Air Force. Benzthiazole substituted diacid terphenyl monomers. 4,892,953, Cl. 548-156.000.

Arnold, Fred E.: *See—*
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,892,921, Cl. 528-183.000.

Arnold & Richter Cine Technik GmbH & Co. Betriebs KG: *See—*
Blaschek, Otto, 4,892,404, Cl. 352-192.000.

Aronson, Herbert L.: *See—*
Kubierschky, Klaus; and Aronson, Herbert L., 4,893,015, Cl. 250-369.000.

Arthur D. Little, Inc.: *See—*
McCullough, John E.; Dieckmann, John T.; and Hosmer, Thomas P., 4,892,469, Cl. 418-55.000.

Arthur Matney Company, Inc.: *See—*
Garcia, Frank, 4,892,194, Cl. 206-470.000.

Asada, Haruo: *See—*
Tsujimoto, Shuichi; and Asada, Haruo, 4,893,187, Cl. 358-261.100.

Asada, Takafumi; Kataoka, Jiro; and Nakagawa, Kouji, to Matsushita Electrical Industrial Co., Ltd. Hydrodynamic bearing device. 4,892,418, Cl. 384-124.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Sanada, Masahiko; Hayashi, Yoshio; Ohnuma, Akira; and Ogawa, Shuichiro, 4,893,148, Cl. 355-27.000.

Asahi Kogaku Kogyo K.K.: *See—*
Matsuda, Atsushi, 4,893,145, Cl. 354-400.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, 4,893,140, Cl. 354-149.110.

Asai, Toshinobu: *See—*
Murakami, Takatoshi; Kida, Toshio; Kon, Shiji; Asai, Toshinobu; and Nunome, Yoshiyuki, 4,892,696, Cl. 264-219.000.

Asami, Masahiro: *See—*
Waki, Kokichi; Hasebe, Kazunori; and Asami, Masahiro, 4,892,803, Cl. 430-380.000.

Asami, Seiichi: *See—*
Mizuno, Takeyuki; and Asami, Seiichi, 4,892,436, Cl. 403-404.000.

Asari, Takashi, to Sumitomo Heavy Industries, Ltd. Casting method and apparatus using twin belt caster. 4,892,132, Cl. 164-431.000.

Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Throttle valve controlling apparatus employing electrically controlled actuator. 4,892,071, Cl. 123-336.000.

ASCII Corporation: *See—*
Ishii, Takatoshi, 4,893,114, Cl. 340-703.000.

Asea Brown Boveri Aktiengesellschaft: *See—*
Geck, Berthold, 4,893,014, Cl. 250-353.000.

Asher, David M.: *See—*
Harrington, Michael G.; Merril, Carl R.; Asher, David M.; and Gajdusek, D. Carleton, 4,892,814, Cl. 435-5.000.

Asia Can Company Limited: *See—*
Hamaguchi, Masami; Yanagihara, Hiromu; Hiraoka, Osamu; and Takahashi, Osamu, 4,892,214, Cl. 220-67.000.

Asten Group, Inc.: *See—*
Penven, Patrick H., 4,892,781, Cl. 428-234.000.

Astrinsky, Eliezer A. Cardiac pacing and/or sensing lead and method of use. 4,892,102, Cl. 128-642.000.

AT&E Corporation: *See—*
Gehring, Mark R., 4,893,341, Cl. 381-7.000.

AT&T Bell Laboratories: *See—*
Carlin, James W.; Chipaloski, Anthony C.; and Schloss, Robert P., 4,893,300, Cl. 370-3.000.

Atochem: *See—*
Beuzelin, Catherine; and Senez, Claude, 4,892,620, Cl. 162-158.000.

Atsumi, Koji: *See—*
Misumi, Masao; and Atsumi, Koji, 4,891,989, Cl. 73-861.220.

Atsumi, Shigeru: *See—*
Tanaka, Sumio; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Imamiya, Keniti, 4,893,275, Cl. 365-189.090.

Aubert, Veronique: *See—*
Magnin, Guy; Champeaud, Marie-Francoise; Aubert, Veronique; and Jaouen, Claude, 4,892,685, Cl. 252-628.000.

Auchterlonie, Richard C. Absolute position sensor having multi-layer windings of different pitches providing respective indications of phase proportional to displacement. 4,893,077, Cl. 324-208.000.

Auchterlonie, Richard C. Absolute position sensing using sets of windings of different pitches providing respective indications of phase proportional to displacement. 4,893,078, Cl. 324-208.000.

Auerbach, Robert A.: *See—*
Warren, Patrick A.; Auerbach, Robert A.; and Polaski, Eugene L., 4,892,756, Cl. 427-206.000.

Aumard, Jean-Pierre, to Scaime. Weighing device for strain gauges. 4,892,163, Cl. 177-211.000.

Aura Systems, Inc.: *See—*
Kurtzman, Zvi; Stuart, Keith O.; and Bartosh, Blake W., 4,892,328, Cl. 280-707.000.

Ausimont S.p.A.: *See—*
Marcora, Giovanni; and Cataldo, Federico, 4,892,669, Cl. 252-30.000.

Ausnit, Steven, to Minigrip, Inc. Bags with reclosable plastic fastener having automatic sealing gasket means. 4,892,414, Cl. 383-63.000.

Avantgarde S.p.A.: *See—*
Cavazza, Paolo, 4,892,729, Cl. 424-73.000.

Avanti International: *See—*
O'Donnell, William P., 4,892,170, Cl. 182-100.000.

Avis, Graham M.: *See—*
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,893,317, Cl. 375-97.000.

AVL AG: *See—*
Wolfbeis, Otto S.; and Braun geb. Hochmuth, Petra, 4,892,640, Cl. 204-418.000.

AVL Gesellschaft Fur Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof. Dr.Dr.H.C. Hans List: *See—*
List, Hans, 4,892,065, Cl. 123-26.000.

Axworthy, William. Self-supporting pedestal. 4,892,978, Cl. 174-38.000.

Ayasli, Yalcin: *See—*
Reynolds, Leonard D.; and Ayasli, Yalcin, 4,893,035, Cl. 307-520.000.

Ayliffe, Peter J.: *See—*
Bloemley, Peter F.; Ayliffe, Peter J.; Huffman, Ewen R. M.; and Yuen, Gregory W. M., 4,893,117, Cl. 340-784.000.
Ayyoubi, Luay; and Beck, Theresa R. Novelty grinder. 4,892,499, Cl. 446-81.000.
B. F. Goodrich Company, The: *See—*
Amjad, Zahid, 4,892,724, Cl. 424-49.000.
Amjad, Zahid, 4,892,725, Cl. 424-49.000.
Baba, Noboru: *See—*
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Bachmann, Peter; and Guenther, Hans U., to Schroff GmbH. Mounting device for conductor plates. 4,892,431, Cl. 403-187.000.
Bader, Joseph F., to Federal Signal Corporation. Dual diverging manifold loudspeaker system. 4,893,343, Cl. 381-156.000.
Baer, Samuel C.: *See—*
Strack, David C.; Baer, Samuel C.; Cates, Diana M.; and Venkatapathy, Raju, 4,891,957, Cl. 66-192.000.
Bahlmann, Bernd; and Walk, Johann, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Device for opening fiber bales. 4,891,863, Cl. 19-80.00R.
Bainbridge, David W.; and Tocci, Mario P., to Manville Corporation. Process for making a moldable fibrous mat. 4,892,695, Cl. 264-119.000.
Baines, Roger F., to Johnson Electric Industrial Manufactory Limited. Brush protection in an electric motor. 4,893,043, Cl. 310-239.000.
Baker, Glenn R.; and French, Janet B. G. Method and apparatus for reducing incontinence or pain. 4,891,847, Cl. 4-239.000.
Baker, James E., Jr., to Goldberg, Ronald. Fishing lure. 4,891,901, Cl. 43-42.110.
Baker, John E.; and Cantu, Ramon, to Frito-Lay, Inc. Steam venting extruder feeder. 4,892,471, Cl. 425-132.000.
Baker, John W.: *See—*
Norbury, Raymond L., Jr.; Baker, John W.; and Poynter, Vernon L., 4,892,288, Cl. 251-306.000.
Balgaard, Luverne O.: *See—*
Dunaway, Thomas J.; Speilberger, Richard K.; Loy, Jerald M.; Dicks, Lori A.; and Balgaard, Luverne O., 4,892,245, Cl. 228-180.200.
Ball, Martin F., to Metal Box p.l.c. Pump chamber dispenser. 4,892,231, Cl. 222-207.000.
Ban, Keisuke; and Daimaru, Akimasa, to Honda Giken Kogyo Kabushiki Kaisha. Method for making a reinforced article for an internal combustion engine. 4,892,130, Cl. 164-97.000.
Bando Chemical Industries, Ltd.: *See—*
Matsuoka, Hiroshi; and Ochiai, Masaki, 4,892,510, Cl. 474-252.000.
Bansal, Ravinder K.; and Vrana, Edward E., to AirSep Corporation. Pressure swing adsorption process and system. 4,892,566, Cl. 55-26.000.
Bantien, Jurgen; Bardenhagen, Dietrich; and Staudte, Erich, to Korber AG. Apparatus for manipulating empty and filled trays for cigarettes and like rod-shaped articles between making and processing machines. 4,892,453, Cl. 414-403.000.
Baran, David F.: *See—*
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Baran, Paul; and Baran, David F. Interactive facsimile system and method of information retrieval. 4,893,333, Cl. 379-100.000.
Barba, Valentin G., to Plessey Incorporated. Linear electromechanical actuator. 4,891,994, Cl. 74-2.000.
Barbier, Bruno J. M.; and Michaud-Soret, Jean A., to Aerospatiale Societe Nationale Industrielle. Blade of composite materials and its manufacturing process. 4,892,462, Cl. 416-226.000.
Bardenhagen, Dietrich: *See—*
Bantien, Jurgen; Bardenhagen, Dietrich; and Staudte, Erich, 4,892,453, Cl. 414-403.000.
Barker, Kent R., to Prevention Sciences Incorporated. Apparatus and method for measurement of urine void volumes. 4,891,993, Cl. 73-863.520.
Barone, Cynthia A.: *See—*
Dixit, Nagaraj S.; Rhinesmith, Robert J.; Sullivan, James J.; Barone, Cynthia A.; Adams, Richard P.; and Lai, Kuo-Yann, 4,892,673, Cl. 252-114.000.
Barrack Technology Limited: *See—*
Remboski, Donald J., Jr., 4,891,970, Cl. 73-116.000.
Barrois, Claus D.; and Dieterich, Philipp A., to Koenig & Bauer Aktiengesellschaft. Sheet feeder and accelerator. 4,892,301, Cl. 271-227.000.
Bartlett, Donald S.; Freed, David I.; and Poynter, William H., Jr., to GMF Robotics Corporation. Apparatus for mastering a robot. 4,892,457, Cl. 414-735.000.
Bartos, Josef A., to Tire Inflation Systems Corp. Vehicle wheel seal assembly. 4,892,128, Cl. 152-417.000.
Bartosh, Blake W.: *See—*
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BASF Aktiengesellschaft: *See—*
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BASF Corporation: *See—*
Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., 4,892,893, Cl. 521-128.000.
Kirk, Paula S.; and Olson, Dale R., 4,892,889, Cl. 514-774.000.
Ryang, Hong-Son, 4,892,918, Cl. 528-15.000.
Bates, Frank S.; Hartney, Mark A.; and Novembre, Anthony E., to American Telephone & Telegraph Company, AT&T Bell Laboratories. Processes involving lithographic materials. 4,892,617, Cl. 156-659.100.
Battenfeld, Kurt: *See—*
Beetz, Horst; and Battenfeld, Kurt, 4,892,015, Cl. 81-9.410.
Batts, Inc.: *See—*
Duester, Everett L.; Blanchard, Russell O.; and Bredeweg, Robert A., 4,892,237, Cl. 223-85.000.
Bauck, Jerald L.: *See—*
Cooper, Duane H.; and Bauck, Jerald L., 4,893,342, Cl. 381-26.000.
Baudon nee Chardon, Sylvie: *See—*
Haldric, Bernard; and Baudon nee Chardon, Sylvie, 4,892,007, Cl. 74-552.000.
Bauer, James A., to Westinghouse Electric Corp. Electromagnetic contactor with energy balanced closing system. 4,893,102, Cl. 335-132.000.
Bauer, Richard D.; Kraska, Ursula A.; and Sondergeld, Manfred A., to Du Pont de Nemours, E. I., and Company. positive working tonable film having a photohardenable layer. 4,892,802, Cl. 430-270.000.
Bauer, Walter; Muller, Jurgen; and Voigtlander, Volkmar, to Agfa-Gevaert AG. Method of processing X-ray film cassettes with phosporus-coated films and a reading station for executing the process. 4,893,011, Cl. 250-327.200.
Baughman, Ray H.: *See—*
Preziosi, Anthony F.; Prusik, Thaddeus; and Baughman, Ray H., 4,892,677, Cl. 252-408.100.
Baum, Jonathan S.: *See—*
Chang, Jun H.; and Baum, Jonathan S., 4,892,578, Cl. 71-94.000.
Baxter International Inc.: *See—*
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 4,892,604, Cl. 156-244.240.
Schmidt, Josef; Ducay, James; and Forman, Hugh, 4,892,222, Cl. 220-356.000.
Bayer Aktiengesellschaft: *See—*
Furstenwerth, Hauke, 4,892,958, Cl. 548-362.000.
Hegasy, Ahmed, 4,892,730, Cl. 424-80.000.
Knerr, Manfred, 4,892,931, Cl. 528-493.000.
Landen, Peter; Paulini, Dieter; and Wagner, Wolfram, 4,891,873, Cl. 28-255.000.
Meyer, Rolf-Volker; Dhein, Rolf; Dietrich, Michael; Bonten, Heinz; Heinz, Hans-Detlef; and Muller, Peter-Rolf, 4,892,927, Cl. 528-324.000.
Ohm, Andreas; Luchtenberg, Helmut; Maegata, Shinji; and Opitz, Wolfgang, 4,892,741, Cl. 424-479.000.
Schutze, Detlef-Ingo; Wunderlich, Klaus; Reinhardt, Karl-Heinz; and Wienkenhover, Martin, 4,892,950, Cl. 546-98.000.
Baylor College of Medicine: *See—*
Findley, William; and Gibbons, William E., 4,892,830, Cl. 435-290.000.
Beauch, Howard D., to General Motors Corporation. Adjustable steering column. 4,892,330, Cl. 280-775.000.
Beck, Roger P.; Castagno, Daniel L.; Craig, Robert B., Jr.; Davidheiser, Timothy S.; Haley, Allen W., Jr.; Huff, Stanley M.; and Radigan, Russell P., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Medical information system. 4,893,270, Cl. 364-900.000.
Beck, Theresa R.: *See—*
Ayyoubi, Luay; and Beck, Theresa R., 4,892,499, Cl. 446-81.000.
Becker, Horst-Peter, to Alfred Teves GmbH. Boost-failure responsive fluid tapping valve in tandem master cylinder with booster piston at pedal-remote end of master cylinder. 4,891,945, Cl. 60-547.100.
Beetz, Horst; and Battenfeld, Kurt, to Wezag GmbH. Pliers for stripping the ends of conductors. 4,892,015, Cl. 81-9.410.
Beever, William H., to Phillips Petroleum Company. Method and apparatus for pultruding non-linear thermoplastic composite articles. 4,892,600, Cl. 156-166.000.
Behling, Hans-Jurgen; and Schmadeke, Friedrichwilhelm, to Schorling GmbH & Co. Refuse collecting vehicle. 4,892,454, Cl. 414-406.000.
Beisswanger, Rudolf, to J. M. Voith GmbH. Unwinding apparatus for a paper or board web. 4,892,263, Cl. 242-58.300.
Bell Communications Research, Inc.: *See—*
Chao, Hung-Hsiang J.; Lee, Sang H.; and Wu, Liang T., 4,893,306, Cl. 370-94.200.
Giacopelli, James N.; and Littlewood, Morgan, 4,893,304, Cl. 370-60.000.
Bell, Donald, to International Computers Limited. Multi-node data processing system. 4,893,231, Cl. 364-200.000.
Bell & Howell Company: *See—*
Svyatsky, Eduard, 4,892,300, Cl. 271-225.000.
Bell, Michael S. Exosketetal carriage for articles to be carried by a person. 4,892,240, Cl. 224-211.000.
Beloit Corporation: *See—*
Roerig, Arnold J.; and Hergert, Richard R., 4,891,874, Cl. 29-115.000.
Wedel, Gregory L., 4,891,891, Cl. 34-23.000.
Belt-Ton Grading Pty., Ltd.: *See—*
Wotton, Phillip J., 4,892,650, Cl. 209-621.000.
Beltramini, Angelo, to Montedison S.p.A. One or more input asynchronous register. 4,893,028, Cl. 307-291.000.
Beltronics, Inc.: *See—*
Bishop, Robert, 4,893,346, Cl. 382-8.000.
Benczur-Urmossy, Gabor: *See—*
von Benda, Klaus; Benczur-Urmossy, Gabor; Berger, Gerhard; Klink, Rainer; and Gierz, Uwe, 4,892,793, Cl. 429-60.000.
Bennett, Douglas D.: *See—*
Kopunek, Thomas V.; and Bennett, Douglas D., 4,892,481, Cl. 433-90.000.
Bennett, Mark H., to Gott Corporation. Combined closure and pouring spout. 4,892,234, Cl. 222-484.000.

Berard, Serge: *See*—
Cournoyer, Andre; Berard, Serge; and Cote, Denis, 4,891,958, Cl. 66-196.000.
Berge, Gary L.: *See*—
Kim, Mark S.; and Berge, Gary L., 4,892,309, Cl. 273-127.00R.
Berger, Gerhard: *See*—
von Benda, Klaus; Benczur-Urmossy, Gabor; Berger, Gerhard; Klink, Rainer; and Gierz, Uwe, 4,892,793, Cl. 429-60.000.
Berlin, Joseph P. Drop-in utility enclosure apparatus. 4,892,346, Cl. 296-37.600.
Berls, Richard W.: *See*—
Vincent, Sheridan E.; and Berls, Richard W., 4,892,804, Cl. 430-380.000.
Bernhardt, Bruno, to IEG Industrie-Engineering GmbH. Arrangement for expelling light volatile contaminants from liquids. 4,892,688, Cl. 261-24.000.
Bertin, Robert D.: *See*—
Miller, Michael B.; and Bertin, Robert D., 4,892,788, Cl. 428-336.000.
Betterton, Jack D.: *See*—
Greco, Robert J.; and Betterton, Jack D., 4,892,269, Cl. 244-53.00R.
Betts, Robert E., to United States of America, Army. Self consumable initiator. 4,892,037, Cl. 102-201.000.
Beuzelin, Catherine; and Senez, Claude, to Atochem. Diurethane latex and processes. 4,892,620, Cl. 162-158.000.
Bhagwat, Pradeep; Harrell, Duronie; Smith, Stephen; and Woods, Samuel G., to Black & Decker Inc. Direct current motor speed control. 4,893,067, Cl. 388-817.000.
Bibik, Frank F., Jr. Beverage temperature controller for a vehicle. 4,892,137, Cl. 165-80.100.
Bibik, Frank F., Jr. Beverage temperature controlling assembly for a vehicle. 4,892,138, Cl. 165-80.100.
Bichon, Daniel; Lamy, Bernard; and Borloz, William, to Imperial Chemical Industries PLC. Biodegradable synthesis polypeptide and its therapeutic use. 4,892,733, Cl. 424-422.000.
Bick, Peter A.; and Kinnell, Christine J., to Jet-R Limited. Devices for aiding resynchronization of body clocks. 4,893,291, Cl. 368-10.000.
Bidabad, Farid M. Electronic sun shield. 4,892,394, Cl. 350-357.000.
Bien, Alfred A.: *See*—
Newman, Howard G.; Monette, David G.; Koczara, Michael D.; Ribant, Duane J.; Papke, Ronald D.; Bien, Alfred A.; and Hawkins, Richard A., 4,892,342, Cl. 292-347.000.
Biloff, Elmer E. Apparatus for securing an article in a pocket. 4,891,865, Cl. 24-3.00H.
Bilsbarrow, Donald W.: *See*—
Rogers, John N.; Lady, James M.; Bilsbarrow, Donald W.; and Trujillo, Rene S., 4,893,242, Cl. 364-426.010.
Biocontrol Technology, Inc.: *See*—
Cupp, James R.; Norman, Robert D.; Purdy, David L.; and Maytin, Orlando, 4,892,518, Cl. 604-93.000.
Biofor, Ltd.: *See*—
Lee, Sung J., 4,892,870, Cl. 514-211.000.
Biogenex Laboratories: *See*—
Pawlak, Jan W., 4,892,817, Cl. 435-21.000.
Biomet, Inc.: *See*—
Brown, David R., 4,892,547, Cl. 623-20.000.
Bioprobe International, Inc.: *See*—
Wong, Raphael C.; and Ngo, That T., 4,892,710, Cl. 422-102.000.
BIOTRONIK Mess- und Therapiegerate GmbH & Co. Ingenieurburo Berlin: *See*—
Schaldach, Max, 4,892,100, Cl. 128-419.0PG.
Bishop, Robert, to Beltronics, Inc. Apparatus for automatically inspecting objects and identifying or recognizing known and unknown portions thereof, including defects and the like, and method. 4,893,346, Cl. 382-8.000.
Bitar, Ali A.: *See*—
Stratton, Kenneth L.; and Bitar, Ali A., 4,893,287, Cl. 367-91.000.
Bittler, Dieter: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,892,867, Cl. 514-178.000.
Bjornberg, Sten; and Ahlstrand, Ove, to Landstingens Inkopscentral, Lic, Ekonomisk Forening. Absorbent pad and method and apparatus for making the same. 4,892,535, Cl. 604-380.000.
Black & Decker Inc.: *See*—
Bhagwat, Pradeep; Harrell, Duronie; Smith, Stephen; and Woods, Samuel G., 4,893,067, Cl. 388-817.000.
Blake, Rodger D.: *See*—
Sheinberg, Haskell; Meek, Thomas T.; and Blake, Rodger D., 4,892,581, Cl. 75-232.000.
Blanchard, Randall D., to John Fluke Mfg. Co., Inc. Touch sensitive visual display system. 4,893,115, Cl. 340-712.000.
Blanchard, Richard A., to Siliconix Incorporated. Method for increasing the performance of trenched devices and the resulting structure. 4,893,160, Cl. 357-23.400.
Blanchard, Russell O.: *See*—
Duester, Everett L.; Blanchard, Russell O.; and Bredeweg, Robert A., 4,892,237, Cl. 223-85.000.
Blaschek, Otto, to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG. Film transport mechanism for a motion picture camera. 4,892,404, Cl. 352-192.000.
Blazer International Corporation: *See*—
Brookes, Geoffrey S.; and Wyers, George J., 4,892,400, Cl. 350-626.000.
Blessing, Mark F.: *See*—
Gautraud, Michael G.; Buie, Thomas M.; and Blessing, Mark F., 4,893,182, Cl. 358-105.000.
Blohm, Knud: *See*—
Stannow, Jorgen C.; Wolff, Bruno; Gade, Niels H.; Espensen, Ib M.; and Blohm, Knud, 4,893,007, Cl. 250-231.0SE.
Blom, Michael D.: *See*—
Parker, Matt, III; Blom, Michael D.; and Miller, Roger K., 4,892,667, Cl. 210-799.000.
Blomley, Peter F.; Ayliffe, Peter J.; Huffman, Ewen R. M.; and Yuen, Gregory W. M., to STC PLC. Liquid crystal driving systems. 4,893,117, Cl. 340-784.000.
Bloom, Walter L.; and Vaughan, Harry L., to Bloomland Special Products, Inc. Fluid dispensing system. 4,891,882, Cl. 30-123.300.
Bloomland Special Products, Inc.: *See*—
Bloom, Walter L.; and Vaughan, Harry L., 4,891,882, Cl. 30-123.300.
Blossfeldt, Dieter, to Siemens Aktiengesellschaft. Circuit arrangement for a digital telephone station. 4,893,337, Cl. 379-424.000.
Blouke, Morley M.: *See*—
Corrie, Brian L.; Blouke, Morley M.; and Heidtmann, Denis L., 4,892,842, Cl. 437-67.000.
Blum, Helmut; and Hemmann, Siglinde, to Henkel Kommanditgesellschaft auf Aktien. Oxa-alkane polyphosphonic acids, their use as thresholders, and complexing compositions containing these compounds. 4,892,679, Cl. 562-21.000.
Blumel, Thomas, to VDO Adolf Schindling AG. Monitoring system for the output stage of a bridge. 4,893,252, Cl. 364-483.000.
Blyth, Randolph C.; and Ucci, Pompelio A., to Monsanto Company. Process for dyeing stain resistant nylon carpets. 4,892,558, Cl. 8-560.000.
Bock, Lawrence A.: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,892,854, Cl. 502-160.000.
Bockwinkel, Gerald J., to Ardco, Inc. Refrigerator door assembly with multiple gasket sealing arrangement. 4,891,912, Cl. 49-484.000.
Bodensiek, Paul H.: *See*—
Marstiller, John A.; Bodensiek, Paul H.; and Grise, Frederick G. J., 4,892,998, Cl. 219-548.000.
Bodor, Nicholas S.; and Loftsson, Thorsteinn, to University of Florida. Composition and method for enhancing permeability of topical drugs. 4,892,737, Cl. 424-449.000.
Boehringer Mannheim GmbH: *See*—
Kerscher, Lorenz; Pautz, Brigitte; Trunk, Gisela; and Ziegenhorn, Joachim, 4,892,815, Cl. 435-7.000.
Weiss, Ludwig; and Hoffman, Georg-Erich, 4,892,833, Cl. 436-97.000.
Boeing Company: *See*—
Covey, James H., 4,892,626, Cl. 204-15.000.
Whitehouse, William A., 4,892,376, Cl. 350-96.200.
Boero, Bruno: *See*—
Lanzarini, Ernesto; and Boero, Bruno, 4,892,177, Cl. 192-106.200.
Bogda, Richard C.; and Georgacakis, George D., to Eaton Corporation. Programmer/timer with combined line and program function switch. 4,892,983, Cl. 200-38.00R.
Boggs, Beryl A., to Allied-Signal Inc. Deflashing method and apparatus. 4,892,018, Cl. 83-15.000.
Boillet, Jacques: *See*—
Delage, Robert; Cadier, Marcel; and Boillet, Jacques, 4,892,573, Cl. 65-179.000.
Boisson, Jean-Yves, to U.S. Philips Corporation. Transmission system having a differential pulse code modulation encoding apparatus and an associated decoding apparatus. 4,893,123, Cl. 341-143.000.
Boland, Leona G.: *See*—
Stevens, Robert A.; Boland, Leona G.; and Chiatalas, John L., 4,892,598, Cl. 156-91.000.
Bolick, Roger E., II; Cawlfield, David W.; and Woodard, Kenneth E., Jr., to Olin Corporation. Modular electrolytic cell and processing apparatus. 4,892,636, Cl. 204-237.000.
Boling, Gerd: *See*—
Steudle, Ernst; Boling, Gerd; and Zillikens, Josef, 4,891,968, Cl. 73-64.300.
Bolinski, Martha M.; and Dumas, Donald J., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,892,575, Cl. 71-90.000.
Bollen, Romain H.; and Florens, Raymond L., to Agfa-Gevaert, N.V. Process for the production of multiple radiographic images. 4,893,021, Cl. 250-487.100.
Boller, George E.: *See*—
Renk, Richard J.; Boller, George E.; and Ebert, Richard M., 4,892,000, Cl. 74-467.000.
Bollweber, Lothar; Jansche, Walter; Hugel, Robert; Pilch, Claus-Dietrich; Rothley, Manfred; and Zabler, Erich, to Robert Bosch GmbH. Circuit arrangement for transmitting measurement values on vehicle wheels. 4,891,973, Cl. 73-146.500.
Boman, Lars, to Molnlycke AB. Disposable liquid-absorbing article. 4,892,532, Cl. 604-366.000.
Bombardier-Rotax-Wien Produktions- und Vertriebsgesellschaft m.b.H.: *See*—
Ranner, Dietrich, 4,892,154, Cl. 172-72.000.
Bonanza Enterprises, Ltd.: *See*—
Zaitsu, Kouji, 4,892,311, Cl. 273-145.00D.
Bonnal, Marie F.: *See*—
Boudou, Alain; and Bonnal, Marie F., 4,893,167, Cl. 357-51.000.
Bonten, Heinz: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Dietrich, Michael; Bonten, Heinz; Heinz, Hans-Detlef; and Muller, Peter-Rolf, 4,892,927, Cl. 528-324.000.

Borden, Dennis M.: *See*—
Favstritsky, Nicolai A.; Rose, Richard S.; Borden, Dennis M.; and Honkomp, David J., 4,892,892, Cl. 521-107.000.

Borden, Inc.: *See*—
Ylvisaker, Jon A., 4,892,744, Cl. 426-111.000.

Boren, Vernie A., to Gulf Development Corporation. Simulated neon sign. 4,891,896, Cl. 40-541.000.

Borloz, William: *See*—
Bichon, Daniel; Lamy, Bernard; and Borloz, William, 4,892,733, Cl. 424-422.000.

Born, Ellis H.; Thurston, David L.; and DeBoer, Lee A., to Hagglunds Denison Corporation. Automatic control for variable displacement pump. 4,892,465, Cl. 417-218.000.

Borstcher, Georges. Articulated shower-bath screen shutters for a bath-tub, a shower receiver and like tub. 4,891,850, Cl. 4-609.000.

Bortner, Hans P.: *See*—
Prigge, Helene; Rurlander, Robert; Schwab, Michael; Bortner, Hans P.; and Englmuller, Andreas, 4,892,568, Cl. 55-73.000.

Bostyn, Roger, to N.V. Michael Van de Weile. Apparatus for regulating the jaw of the cutting rails in face-to-face weaving looms. 4,892,120, Cl. 139-21.000.

Boucher, Wendell: *See*—
Gallioa, George C.; Lien, Charles; Stella, Remo; and Boucher, Wendell, 4,893,227, Cl. 363-26.000.

Boudewijns, Arnoldus J. J., to U.S. Philips Corporation. Amplifier arrangement. 4,893,090, Cl. 330-253.000.

Boudewijns, Arnoldus J. J., to U.S. Philips Corporation. Oscillator circuit comprising an oscillator with a CMOS. 4,893,096, Cl. 331-175.000.

Boudou, Alain; and Bonnal, Marie F., to Pull S.A. Method for programmable laser connection of two superimposed conductors of the interconnect system of an integrated circuit. 4,893,167, Cl. 357-51.000.

Boussetta, Hamadi: *See*—
Cohen, Paul; Morel, Alain; Gomez, Sophie; Clamagirand, Christine M.; Gluschankof, Pablo; Nicolas, Pierre; and Boussetta, Hamadi, 4,892,813, Cl. 435-4.000.

Bouvot, Jean-Francois: *See*—
Robin, Roger; Somme, Jean-Francois; and Bouvot, Jean-Francois, 4,892,248, Cl. 237-12.30B.

Bowers, Wayne E.; and Sprague, Barry N., to Fuel Tech, Inc. Diesel fuel additives and diesel fuels containing soluble platinum group metal compounds and use in diesel engines. 4,892,562, Cl. 44-67.000.

Bowes, Stephen M., Jr., to LVI Group, Inc. Dredge cutterhead tooth assembly. 4,891,893, Cl. 37-67.000.

Bowne, Arlyce T.; Romanet, Robert F.; and Normandin, Sharon E., to Eastman Kodak Company. Photographic element and process. 4,892,805, Cl. 430-387.000.

Bradbury, Roy: *See*—
Gregory, Peter; and Bradbury, Roy, 4,892,859, Cl. 503-227.000.

Braden, James J., to International Business Machines Corp. Nonsaturating temperature independent voltage output driver with adjustable down level. 4,893,032, Cl. 307-456.000.

Bramhall, George H.: *See*—
Sovis, John F.; Smith, Robert M.; and Bramhall, George H., 4,891,861, Cl. 15-344.000.

Branchi, Franca, to Italpack S.p.A. Method for the production of prismatic containers with plane gable surfaces without any lateral ears. 4,891,929, Cl. 53-451.000.

Branson, Mark, to KCL Corporation. Method of making reclosable flexible containers having fastener profiles affixed to exterior of bag walls. 4,892,512, Cl. 493-194.000.

Braun geb. Hochmuth, Petra: *See*—
Wolfbeis, Otto S.; and Braun geb. Hochmuth, Petra, 4,892,640, Cl. 204-418.000.

Bray, Michelle M.: *See*—
Bright, Michael W.; Ziolko, Eric F.; Wilson, Alan L.; Bray, Michelle M.; Hennen, Harry A.; and Weiss, David L., 4,893,339, Cl. 380-28.000.
Wilson, Alan L.; Bright, Michael W.; Bray, Michelle M.; Ziolko, Eric F.; and Weiss, David L., 4,893,308, Cl. 370-109.000.

Brazel, James P., to General Electric Company. Tri-element carbon based heat shield. 4,892,783, Cl. 428-282.000.

Bredeweg, Robert A.: *See*—
Duester, Everett L.; Blanchard, Russell O.; and Bredeweg, Robert A., 4,892,237, Cl. 223-85.000.

Bregnedal, Peter: *See*—
Jensen, Klaus G.; and Bregnedal, Peter, 4,892,878, Cl. 514-327.000.

Bresnen, Harrison. Line marking device. 4,892,251, Cl. 239-150.000.

Bridges, Jeffrey M., to Texas Instruments Incorporated. Method for forming contacts through a thick oxide layer on a semiconductive device. 4,892,845, Cl. 437-195.000.

Bridgestone/Firestone, Inc.: *See*—
Elia, Gerardo P.; Arbour, Gaetan; and Podobnik, Ivan Z., 4,892,473, Cl. 425-197.000.
Lippa, Roberto, 4,892,608, Cl. 156-421.000.

Bridgwater, Jon, to R. H. Peterson Co. Heat shielding of hot fireplaces. 4,892,087, Cl. 126-512.000.

Briggs, Catherine B. A.; and Pitt, Alan R., to Eastman Kodak Company. Non-ionic surface active compounds and photographic materials containing them. 4,892,806, Cl. 430-449.000.

Brighenti, Attilio, to Tecnomare S.p.A. System for the cryogenic processing and storage of combustion products of heat engines. 4,891,939, Cl. 60-278.000.

Bright, Michael W.; Ziolko, Eric F.; Wilson, Alan L.; Bray, Michelle M.; Hennen, Harry A.; and Weiss, David L., to Motorola, Inc. Secure communication system. 4,893,339, Cl. 380-28.000.

Bright, Michael W.: *See*—
Wilson, Alan L.; Bright, Michael W.; Bray, Michelle M.; Ziolko, Eric F.; and Weiss, David L., 4,893,308, Cl. 370-109.000.

Brindopke, Gerhard; and Marten, Manfred, to Hoechst AG. Process for the preparation of 2-oxo-1,3-dioxolanes. 4,892,954, Cl. 549-229.000.

British Aerospace PLC: *See*—
Elford, Andrew M., 4,892,271, Cl. 244-121.000.

British Aerospace Public Limited Company: *See*—
Teagle, Paul, 4,891,986, Cl. 73-634.000.

Broer, Dirk J., to U.S. Philips Corporation. Picture display cell and method of forming an orientation layer on a substrate of the picture display cell. 4,892,392, Cl. 350-339.00R.

Brookes, Geoffrey S.; and Wyers, George J., to Blazer International Corporation. Towing mirror. 4,892,400, Cl. 350-626.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Tanabe, Kazunori; Suzuki, Makoto; Makino, Kazumasa; Shibata, Eiji; Ishida, Kazuhito; Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 4,893,147, Cl. 355-27.000.
Tomatsu, Yoshiya, 4,893,010, Cl. 250-318.000.

Brown, Charles M., to Niagara Lockport Industries Inc. Bladder type shuttle braking apparatus for looms. 4,892,121, Cl. 139-185.000.

Brown, David R., to Biomet, Inc. Partially stabilized knee prosthesis. 4,892,547, Cl. 623-20.000.

Brown de Colstoun, Francois; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; and Moscovici, Jean-Claude M. Station for detecting and locating through laser beams an object or a substance likely to diffuse back at least one part of the incident laser ray and system for sensing a substance such as smoke in particular of a fire such as a forest fire. 4,893,026, Cl. 250-574.000.

Brown, Dorothy M.; and Brown, John S. Interconnecting toy. 4,892,484, Cl. 434-259.000.

Brown, John S.: *See*—
Brown, Dorothy M.; and Brown, John S., 4,892,484, Cl. 434-259.000.

Brown, Peter W., to Outboard Marine Corporation. Multi-cylinder two-stroke engine with reduced cost and complexity. 4,892,066, Cl. 123-73.00V.

Brown, Richard D.; Metz, Doyle R.; and Perkins, Roger W., to Rain Bird Sprinkler Mfg. Corp. Up-spray deflector cup for spraying the underside of plant foliage. 4,892,256, Cl. 239-734.000.

Brown, Richard W., to Aquatrol Corporation. Low-powered remote sensor. 4,893,332, Cl. 379-97.000.

Brown, Thomas R.; and Morrow, Daniel D., to J. I. Case Company. Three point coupling arrangement for a tractor. 4,892,158, Cl. 172-443.000.

Brown University Research Foundation: *See*—
Aebischer, Patrick; Winn, Shelley R.; and Galletti, Pierre M., 4,892,538, Cl. 604-891.100.

Brown & Williamson Tobacco Corporation: *See*—
Strubel, David G., 4,892,109, Cl. 131-194.000.

Bruninga, Kenneth J., to L. R. Nelson Corporation. Adjustable part circle sprinkler assembly. 4,892,252, Cl. 239-205.000.

Brunninger, Manfred: *See*—
Theurer, Josef; and Brunninger, Manfred, 4,892,151, Cl. 171-16.000.

Brunsick Bowling & Billiards Corporation: *See*—
Gautraud, Michael G.; Buie, Thomas M.; and Blessing, Mark F., 4,893,182, Cl. 358-105.000.

Brush Fuses Inc.: *See*—
Goldstein, Michel; Howton, Kenneth D.; and Jones, Larry L., 4,893,106, Cl. 337-159.000.

Bucheler, Herbert; and Weltgen, Paul O., to Henkel Kommanditgesellschaft auf Aktien. Threaded dosing cap. 4,892,126, Cl. 141-381.000.

Buckman Laboratories International, Inc.: *See*—
Rayudu, S. Rao, 4,892,583, Cl. 106-18.320.

Budano, Joseph A., II; Guzik, Andrzei T.; Yorio, Rudy; and Cook, Harold M., to Motorola, Inc. Coaxial connector. 4,892,491, Cl. 439-582.000.

Budano, Joseph A., II: *See*—
Guzik, Andrzej T.; Yorio, Rudy; Budano, Joseph A., II; and Tellam, Mark, 4,892,486, Cl. 439-248.000.

Budde, Richard B.: *See*—
Day, James L.; and Budde, Richard B., 4,892,545, Cl. 623-17.000.

Buie, Thomas M.: *See*—
Gautraud, Michael G.; Buie, Thomas M.; and Blessing, Mark F., 4,893,182, Cl. 358-105.000.

Buja, Frederick J., to Eastman Kodak Company. Method of data acquisition and application for an injection molding process. 4,892,690, Cl. 264-40.100.

Bull S.A.: *See*—
Maury, Christian; Pham, Dan-Tam; and Richard, Jean-Marie, 4,893,207, Cl. 360-114.000.

Bundy, Charles H.; Graham, Robert A.; Kuehn, Stephen F.; Precit, Richard R.; and Rogers, Michael S., to United States of America, Energy. Lithium niobate explosion monitor. 4,893,049, Cl. 310-338.000.

Burdeska, Kurt: *See*—
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Burgdorf, Jochen, to Alfred Teves GmbH. Anti-locking brake system. 4,892,363, Cl. 303-116.000.

Burgdorf, Jochen, to Alfred Teves GmbH. System for the operation of an auxiliary pump. 4,892,364, Cl. 303-116.000.

Burger, Marilyn S.: *See*—
McKee, John M.; and Burger, Marilyn S., 4,893,351, Cl. 455-347.000.

Burgoyne, William F., Jr.; and Dixon, Dale D., to Air Products and Chemicals, Inc. Process for producing mono-ortho-tert-butyl-aniline using silica-alumina catalysts. 4,892,974, Cl. 564-409.000.
Burkett, Jerry L.: *See*—
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Burlington Industries, Inc.: *See*—
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Burr-Brown Corporation: *See*—
Lillis, William J.; and Wang, Anthony D., 4,893,091, Cl. 330-253.000.
Bush, James W.; and Anderson, Gary J., to Copeland Corporation. Rotor balancing. 4,893,044, Cl. 310-261.000.
Butler, Douglas: *See*—
Eaton, S. Sheffield, Jr.; Butler, Douglas; and Parris, Michael, 4,893,272, Cl. 365-145.000.
Butts, H. Bruce, Jr.; Cutler, David N.; Schnorr, Peter C.; and Short, Robert T., to Digital Equipment Corporation. Central processing unit for a digital computer. 4,893,235, Cl. 364-200.000.
B.V. Opische Industrie "De Oude Delft" : *See*—
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Bynum, Byron G.; and Jarrett, Robert B., to Motorola, Inc. Method and circuit for providing adjustable control of short circuit current through a semiconductor device. 4,893,211, Cl. 361-18.000.
C. Hallstroms Verkstader AB: *See*—
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Cadier, Marcel: *See*—
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Caldarola, James F. Device for storing and dispensing of creamers. 4,891,949, Cl. 62-3.200.
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Carlin, James W.; Chipaloski, Anthony C.; and Schloss, Robert P., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Technique for reducing distortion characteristics in fiber-optic links. 4,893,300, Cl. 370-3.000.
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Carlson, Marlon; and Carlson, Julian, 4,891,925, Cl. 52-585.000.
Carlson, Marlon; and Carlson, Julian. Interconnected construction blocks. 4,891,925, Cl. 52-585.000.
Carlson, Robert W.; and Ham, Douglas J., to Custom Printing, Inc. Bottom closure for a beverage container sleeve. 4,892,215, Cl. 220-69.000.
Carmen, Raleigh A.; Leng, Barry S.; Lewis, Willie J.; and Nelson, Edward J., to Miles Laboratories, Inc. Bag for separation and isolation of blood components. 4,892,537, Cl. 604-408.000.
Carnegie-Mellon University: *See*—
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Carrier Corporation: *See*—
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Castagnola, Virginio; Frigerio, E. Giuliano; Pellicciari, Roberto; and Roda, Aldo, to Gipharmex, S.p.A. Derivatives of biliary acids, process for the production thereof and corresponding pharmaceutical compositions. 4,892,868, Cl. 514-182.000.
Castanet, Yves: *See*—
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Cavazza, Paolo, to Avantgarde S.p.A. Soap-free, brushless non-lathering shaving cream. 4,892,729, Cl. 424-73.000.
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Centre International de Recherches Dermatologiques (C.I.R.D.): *See*—
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Chaffee, Edwin G., to American Laser Corporation. Method for assembly of laser mirrors. 4,892,497, Cl. 445-28.000.
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Brown de Colstoun, Francois; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; and Moscovici, Jean-Claude M., 4,893,026, Cl. 250-574.000.
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Brown de Colstoun, Francois; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; and Moscovici, Jean-Claude M., 4,893,026, Cl. 250-574.000.
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Champion, Donald H.; Knifton, John F.; and Su, Wei-Yang, to Texaco Chemical Co. Method for the production of N-methylpyrrolidine. 4,892,959, Cl. 548-579.000.

Chan, Hugo W. K.: *See*—
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Chan, STephen K. C.; and Lawrence, Peter D., to University of British Columbia. Manipulator arm position sensing. 4,893,254, Cl. 364-513.000.

Chaney, Raymond J.: *See*—
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Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., to Altus Corporation. Positive current collector for lithium secondary system. 4,892,796, Cl. 429-196.000.

Chao, Hung-Hsiang J.; Lee, Sang H.; and Wu, Liang T., to Bell Communications Research, Inc. Method and apparatus for multiplexing circuit and packet traffic. 4,893,306, Cl. 370-94.200.

Chapman, Alan S. J.: *See*—
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Chapman, Derek D., to Eastman Kodak Company. Water soluble infrared absorbing dyes and ink-jet inks containing them. 4,892,584, Cl. 106-22.000.

Chapman, Richard A.; and Teng, Clarence W., to Texas Instruments Incorporated. Integrated circuit isolation process. 4,892,614, Cl. 156-643.000.

Charbonneau, Arthur G.; Hale, Stanley N.; and Sayed, Edmond A., to Movats Incorporated. Method and apparatus for remote monitoring of valves and valve operators. 4,891,975, Cl. 73-168.000.

Chato, John D. Device employing resonant chambers to determine wind characteristics. 4,891,976, Cl. 73-189.000.

Chatterjee, Dilip K., to Eastman Kodak Company. Method of making fully dense anisotropic high energy magnets. 4,892,596, Cl. 148-104.000.

Chatterjee, Shyam S.; Gabard, Benard L.; and Jaggy, Hermann E. W., to Willman - Schwabe GmbH & Co. Pharmaceutical compositions containing bilobalide for the treatment of neuropathies Ai. 4,892,883, Cl. 514-464.000.

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Chen, Chung, Wang, to Team Worldwide Corporation. Inflatable suntanner with speedy and homogeneous suntan effect. 4,891,855, Cl. 5-449.000.

Chenoweth, Terrence E.; Hammack, Eugenius S.; and McDonald, Wallace L., to Westinghouse Electric Corp. Preparation of amorphous metal core for use in transformer. 4,892,773, Cl. 428-121.000.

Cheung, Nelson; Gould, Russell J.; and Enriquez, Manuel C., to Signode Corporation. Thermoplastic strap with multiple material structure and weld produced therewith. 4,892,768, Cl. 428-57.000.

Cheung, Peter W.; Gauglitz, Karl F.; Mason, Lee R.; Prosser, Stephen J.; Smith, Robert E.; Wagner, Darrell O.; and Hunsaker, Scott W., to Physio-Control Corporation. Method and apparatus for offsetting baseline portion of oximeter signal. 4,892,101, Cl. 128-633.000.

Cheung, Robin W.; Ho, Bernard W. K.; Chen, Hsiang-Wen; and Chan, Hugo W. K., to Advanced Micro Devices, Inc. Making a low resistance three layered contact for silicon devices. 4,892,844, Cl. 437-194.000.

Chevron Research Company: *See*—
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Chibnik, Sheldon, to Mobil Oil Corporation. Phenolic-containing mannich base reaction products and fuel compositions containing same. 4,892,563, Cl. 44-73.000.

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Chikuma, Kiyofumi; and Okamoto, Sota, to Pioneer Electronic Corporation. Fiber-type light conversion device. 4,892,375, Cl. 350-96.180.

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Chisso Corporation: *See*—
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Cho, Toshitsura: *See*—
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Choe, Eui W., to Hoechst Celanese Corporation. Hydrazide-containing thermoplastic polymers exhibiting nonlinear optical response. 4,892,964, Cl. 558-414.000.

Choi, Byung; C.; Karsner, Grant G.; Lee, Chang-Kuei; Malladi, Madhava; and Milstein, Donald, to Mobil Oil Corporation. Upgrading solvent extracts by double decantation and use of pseudo extract as hydrogen donor. 4,892,644, Cl. 208-107.000.

Chonan, Hideo; Motohashi, Michio; Noguchi, Hirotaka; Ogawa, Kazuo; and Takahashi, Kimio, to Canon Kabushiki Kaisha. Rotating polygon mirror. 4,892,372, Cl. 350-6.800.

Chou, Hsin-Hsin: *See*—
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Chou, Kiyoaki: *See*—
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Christensen, Burton G.; Ratcliffe, Ronald W.; and Chabala, John C., to Merck & Co., Inc. 2-aza substituted-1-carbadethiapen-2-em-3-carboxylic acids. 4,892,869, Cl. 514-210.000.

Christenson, Carl R.; and Alling, Richard L., to Torrington Company, The. Thrust bearing. 4,892,424, Cl. 384-620.000.

Chromcraft Furniture Corp.: *See*—
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Church, John A., to Colgate-Palmolive Co. Method and apparatus for treatment of fabrics in laundry dryers. 4,891,890, Cl. 34-12.000.

Ciba-Geigy Corporation: *See*—
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Clark, James F.; McFadyen, David J.; and Mishra, Pradeep K., to TRW Inc. Rotary vacuum-electrical control. 4,892,984, Cl. 200-61.860.

Clark, Nanette. Portable pet potty and wetting wall. 4,892,058, Cl. 119-1.000.

Clark, Stanley L.; Peters, Carsten H.; and Trommer, Jack R., to Raytheon Company. Radar navigation system. 4,893,127, Cl. 342-386.000.

Cleusix, Willy, to ETA SA Fabriques d'Ebauches. Electronic watch movement comprising time display means having indicator hands. 4,893,292, Cl. 368-88.000.

Cleveland Clinic Foundation, The: *See*—
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Clifton, Michael D.: *See*—
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Close, Donald S., to Syn-Coat Enterprises. Novel foam compositions. 4,892,891, Cl. 521-69.000.

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Weaver, Max A.; Pruett, Wayne P.; Hilbert, Samuel D.; and Coates, Clarence A., Jr., 4,892,923, Cl. 528-190.000.

Cobb, Wesley N., to Standard Oil Company. System and method for preprocessing and transmitting echo waveform information. 4,893,286, Cl. 367-87.000.

Coca-Cola Company, The: *See*—
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Rudick, Arthur G., 4,892,229, Cl. 222-105.000.

Cochran, William H.; and Doyle, Brian P. Fiber reinforcement for resin composites. 4,892,780, Cl. 428-234.000.

Cocks, Franklin H.; and Akers, Scott R., to Duke University. Method for comminuting kidney stones. 4,892,089, Cl. 128-24.00A.

Cogley, John R., Jr., to Qualstar Corporation. Compact, real time tape drive system. 4,893,312, Cl. 371-37.800.

Cohen, Paul; Morel, Alain; Gomez, Sophie; Clamagirand, Christine M.; Gluschankof, Pablo; Nicolas, Pierre; and Boussetta, Hamadi, to Centre National de la Recherche Scientifique. Method for the determination of the enzymatic activity of convertase. 4,892,813, Cl. 435-4.000.

Colgate-Palmolive Co.: *See*—
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Dixit, Nagaraj S.; Rhinesmith, Robert J.; Sullivan, James J.; Barone, Cynthia A.; Adams, Richard P.; and Lai, Kuo-Yann, 4,892,673, Cl. 252-114.000.

Colgate, Samuel O.; and Schrag, Grant M. Ultra-high vacuum device gasket with means of insertion and removal. 4,892,321, Cl. 277-167.500.

Collier-Hallman, Steven J.: *See*—
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Collins, John B.: *See*—
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Collins, Kenneth S.: *See*—
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Commissariat a l'Energie Atomique: *See*—
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Compagnie Generale des Etablissements Michelin-Michelin & Cie: *See*—
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Compagnie Generale des Matieres Nucleaires: *See*—
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Compaq Computer Corporation: *See*—
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Computer Sports Medicine, Inc.: *See*—
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Comurhex Societe Pour la Conversion de l'Ranium en Metal et Hexafluorure: *See*—
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Concentric Pumps Limited: *See*—
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Conklin, Delano M.; and London, Joe F., Jr., to Burlington Industries, Inc. Process for forming crepe fabrics and for temporarily stabilizing high twist filament yarn in the manufacture of such fabrics. 4,892,557, Cl. 8-497.000.

Conoco Inc.: *See*—
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Romine, Hugh E.; and Fu, Ta-Wei, 4,892,642, Cl. 208-39.000.

Contiero, Claudio: *See*—
Andreini, Antonio; Contiero, Claudio; and Galbiati, Paola, 4,892,836, Cl. 437-29.000.

Continental Baking Company: *See*—
Abdelrahman, Abdelrahman A., 4,892,762, Cl. 426-549.000.

Continental Can Company, Inc.: *See*—
Walter, John, 4,892,029, Cl. 92-51.000.
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Cook, Charles F., III. Combination portable x-ray table and stretcher. 4,893,323, Cl. 378-208.000.

Cook, Harold, Jr.: *See*—
Dorfman, Jan L.; Cook, Harold, Jr.; and Moen, Bruce A., 4,892,209, Cl. 215-277.000.

Cook, Harold M.: *See*—
Budano, Joseph A., II; Guzik, Andrzei T.; Yorio, Rudy; and Cook, Harold M., 4,892,491, Cl. 439-582.000.

Cook, John A.: *See*—
Park, George B.; Cook, John A.; and McLoughlin, Robert H., 4,892,559, Cl. 29-623.300.

Cook, Thomas G.; and Geibel, Conrad J., Jr., to American Sterilizer Company. Apparatus for sealing a door. 4,891,910, Cl. 49-395.000.

Cooley, Thomas E. Membrane process for hydrocarbon liquid recovery. 4,892,564, Cl. 55-16.000.

Cooling, Eugene D.; and Cooling, Timothy M., to Joe Cooling & Sons Inc. Sod harvester. 4,892,153, Cl. 172-20.000.

Cooling, Timothy M.: *See*—
Cooling, Eugene D.; and Cooling, Timothy M., 4,892,153, Cl. 172-20.000.

Coone, Malcolm G., to Davis-Lynch, Inc. Inflatable tools. 4,892,144, Cl. 166-122.000.

Cooper, David G., to Eaton Corporation. Clip for securing rotating parts. 4,892,432, Cl. 403-297.000.

Cooper, Duane H.; and Bauck, Jerald L. Head diffraction compensated stereo system. 4,893,342, Cl. 381-26.000.

Cooper, Edward H., Jr.: *See*—
Duran, Joe W.; Kenoyer, Michael L.; Cooper, Edward H., Jr.; and Maeng, JoonYoul, 4,893,326, Cl. 379-53.000.

Cooper Industries: *See*—
Tinley, Raymond K., 4,893,224, Cl. 362-287.000.

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Moner, John M., 4,893,107, Cl. 337-186.000.

Cooper, Susan M.: *See*—
Story, Christopher A.; and Cooper, Susan M., 4,892,382, Cl. 350-96.230.

Copeland Corporation: *See*—
Bush, James W.; and Anderson, Gary J., 4,893,044, Cl. 310-261.000.

Copytele, Inc.: *See*—
DiSanto, Frank J.; and Krusos, Denis A., 4,892,607, Cl. 156-275.700.

Corder, William O., Jr. Golf club swing training device. 4,892,317, Cl. 273-183.00B.

Cordier, Jean; Dussart, Bernard; Petit, Francis; Castanet, Yves; Melloul, Serge; and Mortreux, Andre , to Sollac. Process for the preparation of aldehydes. 4,892,976, Cl. 568-465.000.

Corning Incorporated: *See*—
Tennent, David L.; Fong, Gerald D.; and Hoaglin, Christine L., 4,892,857, Cl. 502-439.000.

Coronet-Werke Heinrich Schlerf GmbH: *See*—
Weihrauch, Georg, 4,892,698, Cl. 264-243.000.

Corrie, Brian L.; Blouke, Morley M.; and Heidtmann, Denis L., to Tektronix, Inc. Method of treating an integrated circuit. 4,892,842, Cl. 437-67.000.

Cortes, Sergio V., to Vitro Flex, S.A. Apparatus for the horizontal bending and tempering of glass sheets. 4,892,574, Cl. 65-273.000.

Cortese, Richard: *See*—
Theeuwes, Felix; Wong, Patrick S. L.; Cortese, Richard; and Eckenhoff, James B., 4,892,778, Cl. 428-218.000.

Costales, Mark J.: *See*—
Parconagian, Doris L.; DeVries, Donald H.; Costales, Mark J.; and Reifschneider, Walter, 4,892,732, Cl. 424-409.000.

Cote, Denis: *See*—
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Cotie, Michael E.: *See*—
Perdelwitz, Lee E., Jr.; Gaddis, Paul G.; Iff, Ron H.; Cotie, Michael E.; and Neogi, Amar N., 4,892,769, Cl. 428-68.000.

Cotter & Company: *See*—
Miller, Drexel R., 4,892,434, Cl. 403-361.000.

Cotton, Lawrence M.; and Derler, John C., to Robert Bosch Power Tool Corporation. Safety guard for sawing power tool particularly mitre saw. 4,892,022, Cl. 83-478.000.

Coughlin, Jeffrey P., to Kohler Co. Geared automatic compression release for an internal combustion engine. 4,892,068, Cl. 123-182.000.

Coughtrie, David P. J.: *See*—
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Cournoyer, Andre; Berard, Serge; and Cote, Denis, to Sport Maska Inc. Double knit fabric with holes therethrough and knitted color bands. 4,891,958, Cl. 66-196.000.

Covey, James H., to Boeing Company. Method for plating one side of a woven fabric sheet. 4,892,626, Cl. 204-15.000.

Cox, Lloyd D. Wrap winder with reversible mounting bracket. 4,892,265, Cl. 242-67.10R.

Coyne & Delany Co.: *See*—
Laverty, Martin J., Jr., 4,891,864, Cl. 91-399.000.

Craig, Robert B., Jr.: *See*—
Beck, Roger P.; Castagno, Daniel L.; Craig, Robert B., Jr.; Davidheiser, Timothy S.; Haley, Allen W., Jr.; Huff, Stanley M.; and Radigan, Russell P., 4,893,270, Cl. 364-900.000.

Credle, William S., Jr.: *See*—
Rudick, Arthur G.; Heenan, Richard H.; and Credle, William S., Jr., 4,892,125, Cl. 141-353.000.

Crescent Metal Products, Inc.: *See*—
Yerman, Donald, 4,892,366, Cl. 312-140.400.

Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, to International Mobile Machines Corporation. Digital signals and frequency correction in a digital wireless system. 4,893,317, Cl. 375-97.000.

Crofoot, James F., to Carrier Corporation. Balanced rolling rotor motor compressor. 4,892,467, Cl. 417-353.000.

Cronauer, Edward A.; and Sarc, Eileen T., to United Technologies Incorporated. Switched power splitter. 4,893,093, Cl. 330-295.000.

Crosfield Electronics Limited: *See*—
Yeomans, Andrew J. V., 4,893,181, Cl. 358-80.000.

Croson, Walter T.: *See*—
Dalrymple, Thomas H.; Daum, Philip J.; and Croson, Walter T., 4,892,042, Cl. 105-362.000.

Cross, Peter E.: *See*—
Alker, David; Campbell, Simon F.; and Cross, Peter E., 4,892,881, Cl. 514-356.000.

Croxton, Malcolm A., to Northrop Corporation. Releasable fastener with gauge, and method. 4,892,449, Cl. 411-54.000.

Crucible Societe Anonyme: *See*—
Van Dyk Burckard, Barney; and Pieterse, Hermanus, 4,892,289, Cl. 251-368.000.

Cullis, Michael D., to Perrier Group of America, Inc., The. Bottled water container. 4,892,207, Cl. 215-100.00A.

Cupp, James R.; Norman, Robert D.; Purdy, David L.; and Maytin, Orlando, to Biocontrol Technology, Inc. Hemodialysis. 4,892,518, Cl. 604-93.000.

Curry, Douglas N., to Xerox Corporation. Arithmetically computed motor hunt compensation for flying spot scanners. 4,893,136, Cl. 346-108.000.

Custom Printing, Inc.: *See*—
Carlson, Robert W.; and Ham, Douglas J., 4,892,215, Cl. 220-69.000.

Cutbarth, Ronald W., to United States of America, Energy. Stable mirror mount. 4,892,283, Cl. 248-466.000.

Cutler, David N.: *See*—
Butts, H. Bruce, Jr.; Cutler, David N.; Schnorr, Peter C.; and Short, Robert T., 4,893,235, Cl. 364-200.000.

Czuba, Leonard F.: *See*—
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 4,892,604, Cl. 156-244.240.

D-R Medical Systems, Inc.: *See*—
Koch, Durmus, 4,892,539, Cl. 623-1.000.

Dabney, Upton R., to Hoover Group, Inc. Box spring assembly. 4,891,853, Cl. 5-247.000.

Daicel Chemical Industries, Ltd.: *See*—
Shibata, Tohru; Namikoshi, Hajime; and Okamoto, Ichiro, 4,892,659, Cl. 210-635.000.

Daigle, Dennis L. Jumping skill training game. 4,892,302, Cl. 272-74.000.

Daikuzono, Shoji: *See*—
Yonekura, Kazuya; and Daikuzono, Shoji, 4,892,726, Cl. 424-63.000.

Daimaru, Akimasa: *See*—
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Dainippon Screen Mfg. Co., Ltd.: *See*—
Yamada, Takuma, 4,892,761, Cl. 427-430.100.

Dairoku, Yorimichi: *See*—
Shioji, Shobu; Sasabe, Masazumi; Dairoku, Yorimichi; and Fujiwara, Teruaki, 4,892,902, Cl. 524-417.000.

D'Aleo, Michael J.; and Spira, Joel S., to Lutron Electronics Co., Inc. Wall box dimming system and face plate and switch assembly therefor. 4,893,062, Cl. 315-291.000.

Dallas, Mark W.: *See*—
Maroney, G. Earl; Dallas, Mark W.; West, Christopher; Diemer, John A.; and Chamberlin, Mark B., 4,892,114, Cl. 137-87.000.

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Glen, Daniel R.; Mansour, Azzam N.; O'Neill, Kathleen M.; Dallek, Steven; and Larrick, Benjamin F., 4,892,629, Cl. 204-56.100.

Dalrymple, Thomas H.; Daum, Philip J.; and Croson, Walter T., to Union Tank Car Company. Combination bottom outlet saddle and sump. 4,892,042, Cl. 105-362.000.

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Rahman, Mahboob F.; Parikh, Dakshesh D.; Daly, Marita E.; and Wang, Bu-Chin, 4,893,279, Cl. 365-230.030.

Damani, Nalinkant C., to G. D. Searle and Company. External analgesic compositions. 4,892,890, Cl. 514-784.000.

Damon, Gerald D.; and Mueller, Robert S., to Eaton Corporation. Viscous damper module for torsional vibration damping mechanism. 4,892,178, Cl. 192-106.200.

Dana Corporation: *See*—
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Danfoss A/S: *See*—
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D'Angelo, Charles: *See*—
Sarin, Vinod K.; and D'Angelo, Charles, 4,892,792, Cl. 428-698.000.

D'Antonio, Nicholas F. Motion detector. 4,892,325, Cl. 280-612.000.

Date, Mitsuko: *See*—
Kudo, Yoshinobu; Fukushima, Akira; Kimura, Kazuo; and Date, Mitsuko, 4,892,398, Cl. 350-475.000.

Datta, Paul J.; and Anderson, Gary C., to Kimberly-Clark Corporation. Nonwoven web useful as a bodyside liner for an absorption article. 4,892,534, Cl. 604-370.000.

Daum, Philip J.: *See*—
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David Piatt & Associates: *See*—
Andersen, David A.; and Harpe, Richard L., 4,892,748, Cl. 426-635.000.

Davidheiser, Timothy S.: *See*—
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Davidson, George S.; and Pierce, Paul E., to United States of America, Energy. Multi-processor including data flow accelerator module. 4,893,234, Cl. 364-200.000.

Davidson, Samuel L., to Mastercrafters Corporation. Composite transom structure. 4,892,054, Cl. 114-357.000.

Davidson Textron Inc.: *See*—
Labrie, Craig B., 4,892,770, Cl. 428-71.000.

Davies, Patricia K.: *See*—
Thomas, David A.; Karr, Robert F.; and Davies, Patricia K., 4,892,412, Cl. 366-145.000.

Davis, Donald H.; Kure-Jensen, Jens; and Jenkins, Solomon, III, to General Electric Company. Silent valve. 4,892,118, Cl. 137-625.300.

Davis-Lynch, Inc.: *See*—
Coone, Malcolm G., 4,892,144, Cl. 166-122.000.

Davis, Walter L., to Motorola, Inc. Low voltage and low power frequency synthesizer. 4,893,087, Cl. 328-14.000.

Davis, Walter L.; Herold, Barry W.; and Little, Wendell L., to Motorola, Inc. Synthesized clock microcomputer with power saving. 4,893,271, Cl. 364-900.000.

Day, James L.; and Budde, Richard B., to Ohio Medical Instrument Company, Inc. Vertebral lock. 4,892,545, Cl. 623-17.000.

DeBoer, Lee A.: *See*—
Born, Ellis H.; Thurston, David L.; and DeBoer, Lee A., 4,892,465, Cl. 417-218.000.

Debus, Klaus. Tire unit and process for manufacturing same. 4,892,129, Cl. 152-516.000.

DeCarlo, Joseph P.: *See*—
Mattar, Wade M.; Thompson, Duane T.; DeCarlo, Joseph P.; Hussain, Yousif; and Chitty, Gordon W., 4,891,991, Cl. 73-861.380.

Decibel Products, Inc.: *See*—
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Deem, Jake O., to Motorola, Inc. Alias tagging time domain to frequency domain signal converter. 4,893,266, Cl. 364-726.000.

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De Groot, Luc M.: *See*—
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Delage, Robert; Cadier, Marcel; and Boillet, Jacques, to Saint-Gobain Vitrage. Process and device for melting glass. 4,892,573, Cl. 65-179.000.

Delago, Pierre C.: *See*—
Hey, John E.; Delago, Pierre C.; and Carlson, James A., 4,892,202, Cl. 212-192.000.

Delaney, Dennis D.; and Gowdy, Hugh W., to Union Oil Company of California. Method for improving the long-term stability of H_2S absorption-oxidation process solutions. 4,892,723, Cl. 423-573.100.

De Lange, Anthonie A., to U.S. Philips Corporation. Apparatus for picking up and placing components. 4,891,879, Cl. 29-822.000.

DeLaquil, Pascal, Jr. License plate holder. 4,891,895, Cl. 40-209.000.

Delco Electronics Corporation: *See*—
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Delgado, Charles B. Bicycle case. 4,892,190, Cl. 206-335.000.

Delma elektro- und medizinische Apparatebau GmbH: *See*—
Mantele, Erwin, 4,891,883, Cl. 30-190.000.

Del Pino Millan, Bienvenido. Electric portable desoldering iron. 4,892,995, Cl. 219-230.000.

Delton, Mary H.; and Eiff, Shari L., to Eastman Kodak Company. Tetra-substituted aryl cyclic formazan dyes. 4,892,937, Cl. 534-652.000.

DeMartino, Ronald N.; Yoon, Hyun-Nam; and Stamatoff, James B., to Hoechst Celanese Corporation. Azomethine compositions having nonlinear optical properties. 4,892,682, Cl. 252-589.000.

DeMent, David L., to Unipac, Inc. Process of making a lined container and the product. 4,892,223, Cl. 220-404.000.

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Den, Tohru: *See*—
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Denda, Masahiko, to Director General, Agenty of Industrial Science and Technology. Semiconductor device with resin bonding to support structure. 4,893,171, Cl. 357-72.000.

Denen, Dennis J.; Thurston, Marlin O.; and Ramsey, Raymond C., to Neoprobe Corporation. Detector and localizer for low energy radiation emissions. 4,893,013, Cl. 250-336.100.

Den Hollander, Jan A.: *See*—
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DeNiro, Vincent L. Leg strengthening and stretching apparatus. 4,892,304, Cl. 272-126.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Watanabe, Yoshiharu; Shimizu, Hisayuki; and Ito, Mineo, 4,892,586, Cl. 106-92.000.

Denman Marvin A.; and Talgam, Yoav, to Motorola, Inc. Method and apparatus for dynamically controlling each stage of a multi-stage pipelined data unit. 4,893,233, Cl. 364-200.000.

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Denman, Marvin A., Jr.; Young, John M.; and Alsup, Mitch K., to Motorola, Inc. Circuit and method for accumulating partial products of a single, double or mixed precision multiplication. 4,893,268, Cl. 364-759.000.

Dentsply Research & Development Corp.: *See*—
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De Rego, Andre , to Schlumberger Industries, S.A. Gas meter having a synthetic diaphragm and molded housing. 4,891,979, Cl. 73-269.000.

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Derrien, Michel; Veaux, Jacques; and Hainaut, Jean-Pierre, to Messier-Haspano-Bugatti. Rocking beam landing gear. 4,892,270, Cl. 244-104.00R.
DesMarais, Thomas A.; Freeland, Mary E.; and Moore, William J., to Procter & Gamble Company, The. Absorbent article having elastic strands. 4,892,536, Cl. 604-385.200.
Dessau, Ralph M., to Mobil Oil Corporation. Dewaxing catalyst based on tin containing materials. 4,892,645, Cl. 208-111.000.
Detrick, Kevin, to Innovative Control Systems, Inc. Computerized car wash co.troller system. 4,893,229, Cl. 364-140.000.
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Deutsche Thomson-Brandt GmbH: *See*—
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Diamant, Bertil: *See*—
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Diamant, Marcus; Diamant, Bertil; and Diamant, Peder M. Instrument for pressing items out of storage spaces. 4,891,886, Cl. 30-363.000.
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Dickson, Charles R.; Johnson, Barry J.; and Gerhardt, David B., to Solarex Corporation. Thin film semiconductor solar cell array and method of making. 4,892,592, Cl. 136-244.000.
Dictaphone Corporation: *See*—
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Diehl GmbH & Co.: *See*—
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Diehl, Walter; and Ringelstein, Hans-Martin, to Degussa Aktiengesellschaft. Dental filling-material and method for its preparation. 4,892,582, Cl. 75-251.000.
Diemer, John A.: *See*—
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Digital Equipment Corporation: *See*—
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Dilk, Gerhard; Klaiber, Rolf; Kreschel, Kurt; Krieg, Wolfgang; Ruckwied, Heinz; and Ulrich, Gerhard, to Robert Bosch GmbH. Headlight for motor vehicles, especially road vehicles. 4,893,218, Cl. 362-61.000.
Dilling, Peter; Prazak, Gerald; and Cashman, Catherine C., to Westvaco Corporation. Lignosulfonate additive-containing carbon black compositions. 4,892,587, Cl. 106-123.100.
Dilling, Peter; Loeffler, Vaughn R.; Prazak, Gerald; and Thomas, Karin U., to Westvaco Corporation. Production of lignosulfonate additives. 4,892,588, Cl. 106-123.100.
Director General, Agenty of Industrial Science and Technology: *See*—
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Dirksing, Robert S.; and Merz, Theodore P., to Procter & Gamble Company, The. Paperboard carton with latching plastic lid. 4,892,247, Cl. 229-125.260.
DiSanto, Frank J.; and Krusos, Denis A., to Copytele, Inc. Chip mounting techniques for display apparatus. 4,892,607, Cl. 156-275.700.
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Dixit, Nagaraj S.; Rhinesmith, Robert J.; Sullivan, James J.; Barone, Cynthia A.; Adams, Richard P.; and Lai, Kuo-Yann, to Colgate-Palmolive Company. Non-aqueous, nonionic heavy duty laundry detergent with improved stability. 4,892,673, Cl. 252-114.000.
Dixon, Dale D.: *See*—
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,892,974, Cl. 564-409.000.
Dobberstein, Robert J.: *See*—
Sierocuk, Thomas J.; and Dobberstein, Robert J., 4,891,851, Cl. 5-81.00R.
Doering, Roger W.; and McManus, Colin F., to Digital Electronics Corporation. Touch panel using modulated light. 4,893,120, Cl. 341-31.000.
Dohogne, L. Ranney: *See*—
Snider, S. Duke; Dohogne, L. Ranney; and Murphy, Patrick K., 4,893,041, Cl. 310-215.000.
Dolan, Donald T., to Pitney Bowes Inc. Mailing machine. 4,892,162, Cl. 177-25.150.
Dolphin, David H.; Nakano, Taku; Kirk, Thomas K.; Wijesekera, Tilak P.; Farrell, Roberta L.; and Maione, Theodore E. Porphyrins. 4,892,941, Cl. 540-145.000.
Dominguez, Ruben, Jr.; Finlay, David E.; Hanna, Stephen D.; Lopez, Jesus C.; Stevenson, David C.; and Zegafuse, Donald W., Jr., deceased (by Smith, Mary A. Zegafuse, executrix), to International Business Machines Corporation. Multidirectional scan and print capability. 4,893,257, Cl. 364-519.000.
Donida, Carlos O.; Degrandi, Isolde H.; De Moraes, Raul; Magdalena, Nelson; and Kreisner, Samuel. Powdered soybeam extract. 4,892,746, Cl. 426-598.000.
Donini, Leone, to Santoni S.r.l. Electromagnetic actuator device, in particular for the selection of the needles on a knitting machine. 4,893,104, Cl. 335-266.000.
Dordan Manufacturing Co.: *See*—
Slavin, Daniel J.; and Kreider, John R., 4,892,195, Cl. 206-473.000.
Dorfman, Jan L.; Cook, Harold, Jr.; and Moen, Bruce A., to Adolph Coors Company. Liquor bottle capping assembly. 4,892,209, Cl. 215-277.000.
Dorr-Oliver Incorporated: *See*—
Pietzsch, Kurt E., 4,892,656, Cl. 210-232.000.
Douglas, Jesse B., Jr., to University of Kentucky Research Foundation, The. Oral drug retaining device. 4,892,483, Cl. 433-229.000.
Douros, Timothy J.: *See*—
Sorensen, Keld; Macri, James N.; Douros, Timothy J.; Sajda, Paul; and Ippolito, Emiddio V., 4,892,405, Cl. 356-243.000.
Dow Chemical Company, The: *See*—
Hazelton, Lowell E., 4,892,579, Cl. 75-0.50B.
Hefner, John G., 4,892,914, Cl. 526-114.000.
Morris, Gregory J. E., 4,892,632, Cl. 204-128.000.
Parconagian, Doris L.; DeVries, Donald H.; Costales, Mark J.; and Reifschneider, Walter, 4,892,732, Cl. 424-409.000.
Wang, Chun S.; Mendoza, Abel; and Fritz, David B., 4,892,925, Cl. 528-219.000.
Dow Corning Wright Corporation: *See*—
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Doyle, Brian P.: *See*—
Cochran, William H.; and Doyle, Brian P., 4,892,780, Cl. 428-234.000.
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Kristiansen, Odd; and Drabek, Jozef, 4,892,880, Cl. 514-342.000.
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Townsend, Leroy B.; Drach, John C.; and Krawczyk, Steven H., 4,892,865, Cl. 514-43.000.
Drain, Kieran F.; Nativi, Larry A.; and Thompson, Richard T., to Loctite Corporation. Fiber/resin composites, and method of making the same. 4,892,764, Cl. 428-34.500.
Dranchak, David W.; Engle, David E.; and Knight, Alan D., to International Business Machines Corporation. Connector assembly with movable carriage. 4,892,487, Cl. 439-260.000.
DT Membranfilter Vertrieba GmbH: *See*—
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Ducay, James: *See*—
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Duello, Leonard E.: *See*—
Reeves, William G.; Roeder, Robert J.; and Duello, Leonard E., 4,892,784, Cl. 428-288.000.

Duester, Everett L.; Blanchard, Russell O.; and Bredeweg, Robert A., to Batts, Inc. Intimate apparel hanger with garment clamping arms. 4,892,237, Cl. 223-85.000.

Duke University: *See*—
Cocks, Franklin H.; and Akers, Scott R., 4,892,089, Cl. 128-24.00A.

Dumas, Donald J.: *See*—
Bolinski, Martha M.; and Dumas, Donald J., 4,892,575, Cl. 71-90.000.

Dunaway, Thomas J.; Speilberger, Richard K.; Loy, Jerald M.; Dicks, Lori A.; and Balgaard, Luverne O., to Honeywell Inc. Controlled compression furnace bonding. 4,892,245, Cl. 228-180.200.

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Dunlop Limited a British Company: *See*—
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Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shun-ichiro; and Lloyd, Kenneth O., to Sloan-Kettering Institute For Cancer Research. Monoclonal antibody for human hematopoietic glycoproteins and method. 4,892,828, Cl. 435-240.270.

Du Pont de Nemours, E. I., and Company: *See*—
Bauer, Richard D.; Kraska, Ursula A.; and Sondergeld, Manfred A., 4,892,802, Cl. 430-270.000.
Bolinski, Martha M.; and Dumas, Donald J., 4,892,575, Cl. 71-90.000.
Fisher, John R.; and Huang, Hua-Feng, 4,892,782, Cl. 428-240.000.
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Shah, Chandrakant S., 4,891,960, Cl. 68-200.000.
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DuPont, Ronald C.: *See*—
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Dura-Line: *See*—
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Durable Packaging Corporation: *See*—
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Dursiraj, Bojayan; Peterson, Alex P., Jr.; and Salee, Gideon, to Indspec Chemical Corporation. Rubber composition and method for making the same. 4,892,908, Cl. 525-160.000.

Durso, Joe W.; Kenoyer, Michael L.; Cooper, Edward H., Jr.; and Maeng, JoonYoul, to Video Telecom Corp. Video-telephone communications system. 4,893,326, Cl. 379-53.000.

Durotech Co.: *See*—
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Duse, Diego. Bottle grade polyester resins reinforced with glass fibers and containers made of such resins. 4,892,763, Cl. 428-34.100.

Dussart, Bernard: *See*—
Cordier, Jean; Dussart, Bernard; Petit, Francis; Castanet, Yves; Melloul, Serge; and Mortreux, Andre , 4,892,976, Cl. 568-465.000.

Dusza, John P.: *See*—
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Dyer, Nigel P.: *See*—
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Earlam, Sandra J.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,893,317, Cl. 375-97.000.

Eastern Company, The: *See*—
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Eastman Kodak Company: *See*—
Agarwala, Ashok K., 4,892,863, Cl. 505-1.000.
Alligood, John H.; and Lawther, Joel S., 4,893,139, Cl. 354-149.100.
Bowne, Arlyce T.; Romanet, Robert F.; and Normandin, Sharon E., 4,892,805, Cl. 430-387.000.
Briggs, Catherine B. A.; and Pitt, Alan R., 4,892,806, Cl. 430-449.000.
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Chapman, Derek D., 4,892,584, Cl. 106-22.000.
Chatterjee, Dilip K., 4,892,596, Cl. 148-104.000.
Delton, Mary H.; and Eiff, Shari L., 4,892,937, Cl. 534-652.000.
Glocker, David A.; and Lesh, Geoffrey C., 4,892,634, Cl. 204-192.150.
Harbison, Kenneth G.; and Gaugh, Wilbur S., 4,892,808, Cl. 430-517.000.
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Long, Michael; Palone, Thomas W.; and Kemp, Paul, 4,892,243, Cl. 226-97.000.
McClure, Richard J., 4,893,208, Cl. 360-118.000.
Ohmori, Seishi; and Niskala, Wayne F., 4,893,133, Cl. 346-76.0PH.
Sales, Milton S.; and Thompson, John R., 4,893,153, Cl. 355-325.000.
Shtipelman, Boris A.; and White, David L., 4,893,206, Cl. 360-106.000.
Smart, David C., 4,893,141, Cl. 354-219.000.
Vanier, Noel R., 4,892,860, Cl. 503-227.000.
Vegh, Bertalan J.; and Pace, Laurel J., 4,892,616, Cl. 156-655.000.
Vincent, Sheridan E.; and Berls, Richard W., 4,892,804, Cl. 430-380.000.
Weaver, Max A.; Coates, Clarence A., Jr.; Pruett, Wayne P.; and Hilbert, Samuel D., 4,892,922, Cl. 528-190.000.
Weaver, Max A.; Pruett, Wayne P.; Hilbert, Samuel D.; and Coates, Clarence A., Jr., 4,892,923, Cl. 528-190.000.

Eastmond, Bruce C.; and Linder, Donald L., to Motorola, Inc. FM communication system with improved response to Rayleigh-faded companded signals. 4,893,347, Cl. 455-52.000.

Eastmond, Bruce C.; and Lum, Wai Elliott, to Motorola, Inc. FM communication system with improved response to rayleigh-faded received signals. 4,893,349, Cl. 455-205.000.

Eaton Corporation: *See*—
Bogda, Richard C.; and Georgacakis, George D., 4,892,983, Cl. 200-38.00R.
Cooper, David G., 4,892,432, Cl. 403-297.000.
Damon, Gerald D.; and Mueller, Robert S., 4,892,178, Cl. 192-106.200.
Dierker, Joseph B., Jr., 4,893,075, Cl. 324-174.000.
Reinicke, Robert H.; and Yang, Jefferson Y. S., 4,892,286, Cl. 251-129.110.
Torrence, Robert J., 4,892,285, Cl. 251-129.050.

Eaton, S. Sheffield, Jr.; Butler, Douglas; and Parris, Michael, to Ramtron Corporation. Ferroelectric retention method. 4,893,272, Cl. 365-145.000.

Ebeling, Wolfgang, to Turmag Turbo-Maschinen-AG Nussel & Grafer. Rotary rock drilling machine. 4,892,161, Cl. 175-195.000.

Ebert, Richard M.: *See*—
Renk, Richard J.; Boller, George E.; and Ebert, Richard M., 4,892,000, Cl. 74-467.000.

Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yuji, to Canon Kabushiki Kaisha. Recording apparatus and ink cartridge. 4,893,137, Cl. 346-134.000.

Eccles, Lawrence A.: *See*—
Klainer, Stanley M.; Goswami, Kisholoy; Herron, Nelson R.; Simon, Stephen J.; and Eccles, Lawrence A., 4,892,383, Cl. 350-96.290.

Eckenhoff, James B.: *See*—
Theeuwes, Felix; Wong, Patrick S. L.; Cortese, Richard; and Eckenhoff, James B., 4,892,778, Cl. 428-218.000.

Eder, Robert L.: *See*—
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Edward Weck Incorporated: *See*—
Steer, Peter L., 4,892,530, Cl. 604-338.000.

Eguchi, Yosuke: *See*—
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Ehrlich, Susan J.: *See*—
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EIC Laboratories, Inc.: *See*—
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Eiff, Shari L.: *See*—
Delton, Mary H.; and Eiff, Shari L., 4,892,937, Cl. 534-652.000.

Eitman, David A., to Science Applications International Corporation. Refractory composite articles and method of making such articles. 4,892,755, Cl. 427-203.000.

Eitner, Dorothea; Kuehnke, Hermann; Messingschlager, Elisabeth; and Wilke, Dorothea, to Siemens Aktiengesellschaft. X-radiator, particularly for producing intra-oral dental exposures. 4,893,321, Cl. 378-121.000.

Electricite de France Service National: *See*—
Patin, Pierre; and Patin, Pierre-Armand, 4,892,507, Cl. 474-50.000.

Elford, Andrew M., to British Aerospace PLC. Corona discharge surface treatment and aircraft cockpit canopies so treated. 4,892,271, Cl. 244-121.000.

Elford, David, to University of Western Australia, The. Sheep handling and manipulation for automated shearing. 4,892,062, Cl. 119-98.000.

Eli Lilly and Company: *See*—
Carr, Lucinda G.; Ingolia, Thomas D.; Queener, Stephen W.; and Skatrud, Paul L., 4,892,819, Cl. 435-69.100.
Munroe, John E., 4,892,942, Cl. 540-205.000.
Rizzo, John R.; and Tao, Eddie V. P., 4,892,956, Cl. 548-356.000.

Elia, Gerardo P.; Arbour, Gaetan; and Podobnik, Ivan Z., to Bridgestone/Firestone, Inc. Head for extrusion of elastomeric contour innerliner. 4,892,473, Cl. 425-197.000.

Elliott, E. J.; Prill, Fred W.; and Fisher, Douglas R. Asphalt mixer apparatus and method. 4,892,411, Cl. 366-25.000.

Elliott, Robert H. Equipment and method to remove particulate and dissolved particles from steam. 4,892,571, Cl. 55-458.000.

Ellisor, Milton W., Jr.: *See*—
Snow, Richard K.; and Ellisor, Milton W., Jr., 4,892,410, Cl. 366-2.000.

Ellwanger, Russell C.: *See*—
Schmitz, Johannes E. J.; Van Dijk, Antonius J. M.; and Ellwanger, Russell C., 4,892,843, Cl. 437-192.000.

Elscint Ltd.: *See*—
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Emerson Electric Co.: *See*—
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Emerson, John D.; and Hill, Scott D., to United States of America, Army. Ring detonator for shaped-charge warheads. 4,892,039, Cl. 102-476.000.

Emhart Industries, Inc.: *See—*
Fenton, Frank A., 4,892,183, Cl. 198-468.300.
Hueber, William J.; Eder, Robert L.; and Cearlock, R. Keith, 4,892,982, Cl. 200-38.00R.

Emori, Teruaki; Mase, Hiroyuki; and Kitamura, Ikuo, to Fujitsu Limited. Track access control system for magnetic disk apparatus. 4,893,201, Cl. 360-77.040.

Endo, Fumio; Kimura, Toshiyuki; and Aoyagi, Yoshio, to Pioneer Electronic Corporation. Method for operating multidisk player. 4,893,293, Cl. 369-34.000.

Endo, Fumio: *See—*
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,893,294, Cl. 369-44.000.

Endo, Takeshi: *See—*
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Endo, Tetsuji; and Nishijima, Kazuyoshi, to Nihon Plast Co., Ltd. Steering wheel rim core and elongated blank therefor. 4,892,006, Cl. 74-552.000.

Endocon, Inc.: *See—*
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Engineering & Research Associates, Inc.: *See—*
Harmony, Daniel C.; and Noble, Bradley T., 4,892,668, Cl. 210-782.000.

Engle, David E.: *See—*
Dranchak, David W.; Engle, David E.; and Knight, Alan D., 4,892,487, Cl. 439-260.000.

Englmuller, Andreas: *See—*
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Ennerdal, Leif: *See—*
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Enomoto, Harumitsu: *See—*
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Ogawa, Masahide; Sato, Teiji; Takahashi, Masao; and Enomoto, Kazumitsu, 4,892,591, Cl. 106-482.000.

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Cheung, Nelson; Gould, Russell J.; and Enriquez, Manuel C., 4,892,768, Cl. 428-57.000.

Epler, Frederick A.: *See—*
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Ericson Manufacturing Company: *See—*
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Ericsson, Bertil: *See—*
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Ericsson, Karl-Gustav; and Ericsson, Bertil. Building structure. 4,891,923, Cl. 52-280.000.

Erman, Marko: *See—*
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Ernst Jacobi & Co. KG.: *See—*
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Erpenbach, Heinz; Gehrmann, Klaus; and Horstermann, Peter, to Hoechst Aktiengesellschaft. Process for the preparation of n-acetylphenylalanine. 4,892,971, Cl. 562-450.000.

Eskelinen, Pekka, to Valmet Paper Machinery, Inc. Method and device for measuring permeability/penetrability of fabric in a paper machine. 4,892,621, Cl. 162-198.000.

Eskelinen, Pekka: *See—*
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.

Espensen, Ib M.: *See—*
Stannow, Jorgen C.; Wolff, Bruno; Gade, Niels H.; Espensen, Ib M.; and Blohm, Knud, 4,893,007, Cl. 250-231.0SE.

Esquivel, Agerico L.; Groover, Robert, III; and Tigelaar, Howard L., to Texas Instruments Incorporated. EPROM with increased floating gate/control gate coupling. 4,892,840, Cl. 437-52.000.

Estkowski, Michael H.; Minor, Don E.; and Lastuck, Lennard V., to Shepherd Products U.S., Inc. Chair seat tilt control. 4,892,354, Cl. 297-301.000.

ETA SA Fabriques d'Ebauches: *See—*
Cleusix, Willy, 4,893,292, Cl. 368-88.000.

Ethicon, Inc.: *See—*
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Ethyl Corporation: *See—*
Stahly, G. Patrick, 4,892,965, Cl. 560-118.000.
Wright, William E., 4,892,896, Cl. 523-300.000.

Eto, Kunihiko; Mori, Yutaka; Tanooka, Shigeo; and Kodama, Kazumasa, to Toyoda Koki Kabushiki Kaisha. Device for detecting driving condition for automobile. 4,893,239, Cl. 364-424.050.

Evans, Daniel D., Jr., to Hughes Aircraft Company. Digital servo employing switch mode lead/lag integrator. 4,893,068, Cl. 318-615.000.

Evans, David H., to U.S. Philips Corporation. Integrated millimeter-wave transceiver. 4,893,126, Cl. 342-175.000.

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Evergreen Industries, Inc.: *See—*
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Ewald, Egon: *See—*
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Ewen, John A.; and Razavi, Abbas, to Fina Technology, Inc. Process and catalyst for producing syndiotactic polyolefins. 4,892,851, Cl. 502-104.000.

Extrude Hone Corporation: *See—*
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Exxon Production Research Company: *See—*
Gunderson, Richard H.; Burns, Jerome Q.; and Fox, Stewart A., 4,892,337, Cl. 285-333.000.
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Exxon Research and Engineering Company: *See—*
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Leonowicz, Michael E.; Vaughan, David E. W.; and Strohmaier, Karl G., 4,892,721, Cl. 423-328.000.
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Sweet, James R., 4,892,660, Cl. 210-637.000.

Ezaki, Joichiro; Itoh, Yoshiaki; Katase, Shunichi; and Matsuzaki, Mikio, to TDK Corporation. Magnetic head. 4,893,203, Cl. 360-103.000.

Famag Fahrzeug- und Maschinenhandelsgesellschaft m.b.H. Nfg.KG.: *See—*
Wachter, Johann, 4,891,858, Cl. 15-82.000.

Fang, Wei-Chou; and Vyas, Brijesh, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Non-aqueous cell comprising niobium triselenide. 4,892,795, Cl. 429-194.000.

Fanuc Ltd.: *See—*
Seki, Masaki; and Samukawa, Koji, 4,893,251, Cl. 364-474.290.

Faroudja, Yves C. Adaptive comb filter for quadrature modulated color television systems. 4,893,176, Cl. 358-31.000.

Farrall, George A., to General Electric Company. Multi-gap switch. 4,893,048, Cl. 310-331.000.

Farrar, David: *See—*
Hawe, Malcolm; and Farrar, David, 4,892,916, Cl. 526-304.000.

Farrell, Richard: *See—*
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Farrell, Roberta L.: *See—*
Dolphin, David H.; Nakano, Taku; Kirk, Thomas K.; Wijesekera, Tilak P.; Farrell, Roberta L.; and Maione, Theodore E., 4,892,941, Cl. 540-145.000.

Farrenkopf, Dennis R.; and Snyder, William J., to Union Carbide Corporation. Ignition system and method for post-mixed burner. 4,892,475, Cl. 431-8.000.

Farrington, Allan P.; and Marshall, Gerald M., to Johnson & Johnson. Apparatus for layered flanged fibrous pad formation. 4,892,470, Cl. 425-80.100.

Fattahi, Farrokh, to Spectrum 2000, Inc. Moisture monitor and control system. 4,892,113, Cl. 137-78.300.

Favstritsky, Nicolai A.; Rose, Richard S.; Borden, Dennis M.; and Honkomp, David J., to Great Lakes Chemical Corporation. Flame retardant polyurethane foam compositions containing polynuclear-brominated alkylbenzene. 4,892,892, Cl. 521-107.000.

Federal Signal Corporation: *See—*
Bader, Joseph F., 4,893,343, Cl. 381-156.000.

Fedor, Joseph V., to United States of America, National Aeronautics and Space Administration. Active damping of spacecraft structural appendage vibrations. 4,892,273, Cl. 244-158.00R.

Fend, Fritz M., to Samsonite Furniture Company. Chair construction. 4,892,355, Cl. 297-440.000.

Fenton, Frank A., to Emhart Industries, Inc. Take-out mechanism for a glass container forming machine. 4,892,183, Cl. 198-468.300.

Ferag AG: *See—*
Frei, Hans, 4,892,186, Cl. 198-803.010.

Ferguson, Arthur R., to Outboard Marine Corporation. Power steering mechanism for marine installations. 4,892,494, Cl. 440-61.000.

Fernandez, Raul F.; and Urbieta, Ignacio, Jr., to Racal Data Communications Inc. Inband dynamic port allocation. 4,893,305, Cl. 370-84.000.

FiberChem Inc.: *See—*
Klainer, Stanley M.; Goswami, Kisholoy; Herron, Nelson R.; Simon, Stephen J.; and Eccles, Lawrence A., 4,892,383, Cl. 350-96.290.

Fields, Larry R., to GTE Products Corporation. Lamp with a captured reflector and method of manufacture. 4,893,050, Cl. 313-113.000.

Fieschi, Giorgio, to Rockwell-Rimoldi, S.p.A. Sewing machine for feeding and cutting ribbon like pieces of different widths. 4,892,047, Cl. 112-122.000.

Figgie, Harry E., III; Zarnowski, Alfred J.; and Lyons, Matthew V., to Osteonics Corp. Dual-radius acetabular cup component. 4,892,549, Cl. 623-22.000.

Filipkowski, Richard C.: *See—*
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Fina Technology, Inc.: *See—*
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Findley, William; and Gibbons, William E., to Baylor College of Medicine. Environmentally controlled in vitro incubator. 4,892,830, Cl. 435-290.000.

Finkelstein, Neal B. Face and head support assembly for use with a lounge chair or like structure. 4,891,854, Cl. 5-435.000.

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Fischer, Robert R.; and Fischer, W. James, to Urschel Laboratories Incorporated. Method of making a knife having a scalloped cutting edge. 4,891,885, Cl. 30-355.000.

Fischer, W. James: *See*—
Fischer, Robert R.; and Fischer, W. James, 4,891,885, Cl. 30-355.000.

Fischer, Walter; and Somlo, Tibor, to Ciba-Geigy Corporation. Process for the preparation of 1-nitroanthraquinone. 4,892,686, Cl. 552-253.000.

Fischer, Wolfgang; Hattich, Thomas; Krug, William; and Schuster, Gerhard, to Grace Service Chemicals GmbH. Process for producing articles made from polyurethane foam and additive for performing this process. 4,892,585, Cl. 106-38.220.

Fisher, Carole A.; and Paxman, David H., to U.S. Philips Corporation. Method of manufacturing an insulated gate field effect transistor. 4,892,838, Cl. 437-41.000.

Fisher, Douglas R.: *See*—
Elliott, E. J.; Prill, Fred W.; and Fisher, Douglas R., 4,892,411, Cl. 366-25.000.

Fisher, John R.; and Huang, Hua-Feng, to Du Pont de Nemours, E. I., and Company. Fibrous microwave susceptor packaging material. 4,892,782, Cl. 428-240.000.

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Fitzgerald, David: *See*—
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Fletcher, John E., to Ambi-Rad Limited. Space heating appliance. 4,892,084, Cl. 126-92.0AC.

Fletcher-Terry Company, The: *See*—
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Flex Technologies, Inc.: *See*—
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Flexwatt Corporation: *See*—
Marstiller, John A.; Bodensiek, Paul H.; and Grise, Frederick G. J., 4,892,998, Cl. 219-548.000.

Flint, William W., III; and Filipkowski, Richard C., to United Technologies Corporation. Apparatus and method for determining airspeed and direction. 4,893,261, Cl. 364-565.000.

Flo-Con Systems, Inc.: *See*—
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Florens, Raymond L.: *See*—
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FMC Corporation: *See*—
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Fong, Gerald D.: *See*—
Tennent, David L.; Fong, Gerald D.; and Hoaglin, Christine L., 4,892,857, Cl. 502-439.000.

Foos, Douglas E., to Plastofilm Industries, Inc. Container/dispenser for wet wipes and the like. 4,892,220, Cl. 220-339.000.

Ford, John, to Plough, Inc. Seal for a dosage dispenser tube. 4,892,427, Cl. 401-182.000.

Ford Motor Company: *See*—
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Forsyth Dental Infirmary For Children d/b/a Forsyth Dental Center, The: *See*—
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Fortsch, Bruno, to Ciba-Geigy Corporation. Process for the preparation of 1-amino-2-naphthol-4-sulfonic acid. 4,892,969, Cl. 562-70.000.

Fortuna-Werke Maschinenfabrik GmbH: *See*—
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Foxboro Company, The: *See*—
Mattar, Wade M.; Thompson, Duane T.; DeCarlo, Joseph P.; Hussain, Yousif; and Chitty, Gordon W., 4,891,991, Cl. 73-861.380.

Fr. Kammerer GmbH: *See*—
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Framatome: *See*—
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Franco, Victor A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for restricting credit card communication calls. 4,893,330, Cl. 379-91.000.

Frank, Nancy S.: *See*—
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Franz Plasser Bahnbaumaschinen-Industrie GmbH: *See*—
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Theurer, Josef; and Brunninger, Manfred, 4,892,151, Cl. 171-16.000.

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Freeman Chemical Corporation: *See*—
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Freeman, Richard R., to Concentric Pumps Limited. Method of making pump impeller by lost-foam molding. 4,891,876, Cl. 29-156.80R.

Frei, Hans, to Ferag AG. Clock conveyor provided with a plurality of entrainment members. 4,892,186, Cl. 198-803.010.

Freisale, Manfred F. A., to Screenex Wire Weaving Manufacturers (Proprietary) Limited. Screening arrangement. 4,892,767, Cl. 428-52.000.

French, Janet B. G.: *See*—
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Frese, Karl W., Jr., to SRI International. Microdevice for gas and vapor sensing. 4,892,709, Cl. 422-98.000.

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Friedman, Arthur S. Portable light. 4,893,221, Cl. 362-108.000.

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Fuchs, Hugo, to BASF Aktiengesellschaft. Workup of distillation residues from the purification of caprolactam. 4,892,624, Cl. 203-37.000.

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Fuji Kagaku Kogyo Kabushiki Kaisha: *See*—
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Fuller, Robert M.; Epler, Frederick A.; and Manowski, Maxwell E., to Fuller Research and Development Company. Remote access telephone control system. 4,893,335, Cl. 379-200.000.
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Gautraud, Michael G.; Buie, Thomas M.; and Blessing, Mark F., to Micronyx, Inc.; and Brunsick Bowling & Billiards Corporation. Video tracking and display system. 4,893,182, Cl. 358-105.000.
Gazdar, Adi F.; and Oie, Herbert K., to United States of America, Health and Human Services. Human plasma cell line having rearranged c-myc proto-oncogene. 4,892,829, Cl. 435-240.200.
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Huelster, David S., 4,891,934, Cl. 60-39.080.
McDonald, Brian P.; and Collier-Hallman, Steven J., 4,893,073, Cl. 324-117.00H.
Nestor, Charles R.; and Yurtin, John A., 4,892,488, Cl. 439-438.000.
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Genske, Roger P., to American National Can Company. Films using blends of polypropylene and polyisobutylene. 4,892,911, Cl. 525-240.000.
Gentner, Jean-Louis; and Erman, Marko, to U.S. Philips Corp. Integrated semiconductor arrangement of the coupling type between a photodetector and a light waveguide. 4,893,162, Cl. 357-30.000.
Georgacakis, George D.: *See*—
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George Hurst Level Winders, Inc.: *See*—
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Gerhard, Anton, to "Toge-Dubel" A. Gerhard Gmbh. Fastening element consisting of a tie bolt and a clamping wedge. 4,892,450, Cl. 411-78.000.
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Gerlowski, Leonard E.; and Kastelic, John R., to Shell Oil Company. Process for preparing melt processed polyketone-based barrier polymer materials. 4,892,697, Cl. 264-234.000.
Germanaz, Patrick; Lamirault, Sylvie; and Picard, Gerard, to Comurhex Societe Pour la Conversion de l'Ranium en Metal et Hexafluorure. Process for the passivating anodization of copper in a medium of molten fluorides, and use for the protection of copper parts of fluorine electrolysers. 4,892,630, Cl. 204-59.500.
Gesser, Hyman D. Removal of aldehydes and acidic gases from indoor air. 4,892,719, Cl. 423-245.100.
Getrost, Wilfried: *See*—
Wald, Hanns J.; Getrost, Wilfried; and Lang, Sigrid, 4,892,777, Cl. 428-212.000.
Giacopelli, James N.; and Littlewood, Morgan, to Bell Communications Research, Inc. Broadband packet switch with combined queuing. 4,893,304, Cl. 370-60.000.
Giannuzzi, Louis N. Roof anchor and stress plate assembly. 4,892,429, Cl. 411-383.000.
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Findley, William; and Gibbons, William E., 4,892,830, Cl. 435-290.000.
Gibson, Peter O. Bullet bicycle pedal. 4,892,009, Cl. 74-594.600.
Gierz, Uwe: *See*—
von Benda, Klaus; Benczur-Urmossy, Gabor; Berger, Gerhard; Klink, Rainer; and Gierz, Uwe, 4,892,793, Cl. 429-60.000.
Gieske, Detlef J.; and Kawchak, David B. Display panel. 4,891,897, Cl. 40-618.000.
Gil, Yoram. Supplemental sailboat propulsion device. 4,892,493, Cl. 440-17.000.
Gilbaugh, James H. Finger mounted surgical needle guide/needle protector. 4,892,520, Cl. 604-117.000.
Gill, Robert A.; and Sanders, Nigel D., to Pfizer Inc. Precipitated calcium carbonate-cationic starch binder as retention aid system for papermaking. 4,892,590, Cl. 106-214.000.
Gillespie, John R., to Gillespie & Powers, Inc. Furnace roof and method of constructing the same. 4,892,046, Cl. 110-332.000.
Gillespie & Powers, Inc.: *See*—
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Girelli, Leonard, to Mattel, Inc. Doll's head and method of fabrication. 4,892,501, Cl. 446-372.000.
Girodat, Joseph C.; Rumble, David W.; Sweetman, Lawrence M.; and Swindall, William, to Massey-Ferguson Services N.V. Crop processing apparatus. 4,893,241, Cl. 364-424.070.
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Glasheen, Wiliam M., to Ametek, Inc. High temperature fiber optic connector. 4,892,381, Cl. 350-96.220.
Gleeson, William J., III. Multiple afferent sensory stimulation device. 4,892,106, Cl. 128-745.000.
Glen, Daniel R.; Mansour, Azzam N.; O'Neill, Kathleen M.; Dallek, Steven; and Larrick, Benjamin F., to United States of America, Navy. Electrochemical preparation of silver oxide electrodes having high thermal stability. 4,892,629, Cl. 204-56.100.
Glenn, Max C., to Honeywell Inc. Force sensor with attached mass. 4,891,985, Cl. 73-517.00R.
Glocker, David A.; and Lesh, Geoffrey C., to Eastman Kodak Company. Method of preparing thermo-magneto-optic recording elements. 4,892,634, Cl. 204-192.150.
Gluschankof, Pablo: *See*—
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Gollwitzer, Lee H.: *See*—
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Gomez, Sophie: *See*—
Cohen, Paul; Morel, Alain; Gomez, Sophie; Clamagirand, Christine M.; Gluschankof, Pablo; Nicolas, Pierre; and Boussetta, Hamadi, 4,892,813, Cl. 435-4.000.
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Goodson, J. Max, to Forsyth Dental Infirmary For Children d/b/a Forsyth Dental Center, The. Intra-pocket drug delivery devices for treatment of periodontal diseases. 4,892,736, Cl. 424-435.000.
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Goswami, Kisholoy: *See*—
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Grabowski, David N.: *See—*
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Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., to BASF Corporation. Flame retardant polyurethane foams resistant to cigarette smoldering ignition. 4,892,893, Cl. 521-128.000.

Grace Service Chemicals GmbH: *See—*
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Gradl, Reinhold; and Popp, Klaus, to Hoechst CeramTec Aktiengesellschaft. Process for vacuum-tight sealing of a ceramic tube. 4,892,498, Cl. 445-44.000.

Graham, Donald J. Support device for a disposable trash bag. 4,892,224, Cl. 220-404.000.

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Grasseschi, John J. Plumbing sealing system. 4,892,116, Cl. 137-360.000.

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Great Lakes Chemical Corporation: *See—*
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Greenwood, Michael J.; and Coughtrie, David P. J. Production of directionally limited acoustic power spectra. 4,893,289, Cl. 367-136.000.

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Grieve Corporation, The: *See—*
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Grieve, Douglas V., to Grieve Corporation, The. Airflow distribution system for discharging air from a thin plenum, and oven employing same. 4,892,030, Cl. 98-1.000.

Griffiths, Ronald S.; and Searles, John E., to R. and A. Bailey & Company Limited. Dispensing measures. 4,892,236, Cl. 222-640.000.

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Groat, John L., to Ford Motor Company. Articulated steering driveshaft. 4,892,002, Cl. 74-492.000.

Grollier, Jean-Francois, to Societe Anonyme dite: L'OREAL. Cosmetic or dermopharmaceutical compositions containing a powder of sweet lupine seeds essentially free of alkaloids. 4,892,727, Cl. 424-69.000.

Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, to Societe Anonyme dite: L'Oreal. Anhydrous composition, stable to oxidation, of anthralin or one of its derivatives in a fatty acid alkyl ester and its use in the treatment of skin diseases. 4,892,888, Cl. 514-132.000.

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Grosser, Zoe A.; Collins, John B.; and Pruszkowski, Ewa M., to Perkin-Elmer Corporation, The. Standardization of spectral lines. 4,893,259, Cl. 364-525.000.

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Groundwater Technology, Inc.: *See—*
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Guardiola, Agustin D., to Talleres Daumar S.A. Automatic discharging trough for use in a weighing machine. 4,892,185, Cl. 198-477.100.

Gueguen, Jean-Pierre; N'Guyen, Annick; and Pottier, Jacques, to Commissariat a l'Energie Atomique. Array electron accelerator. 4,893,058, Cl. 315-5.000.

Guelich, Johann. Axial thrust equalizer for a liquid pump. 4,892,459, Cl. 415-104.000.

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Guenther, Hans U.: *See—*
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Guerra, Carlos; Lee, John; and Johnson, Mark, to Polycast Technology Corporation. Process for making multilayered, formable laminates. 4,892,700, Cl. 264-510.000.

Guilinger, Terry R., to United States of America, Energy. Electrodeposition of amorphous ternary nickel-chromium-phosphorus alloy. 4,892,628, Cl. 204-44.700.

Gulf Development Corporation: *See—*
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Gullion, Steven D.: *See—*
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Gunderson, Richard H.; Burns, Jerome Q.; and Fox, Stewart A., to Exxon Production Research Company. Fatigue-resistant threaded connector. 4,892,337, Cl. 285-333.000.

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Guzik, Andrzej T.; Yorio, Rudy; Budano, Joseph A., II; and Tellam, Mark, to Motorola, Inc. Portable communications device adaptor. 4,892,486, Cl. 439-248.000.

H. Lundbeck A/S: *See—*
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H.P.S. Merrimack Corp.: *See—*
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Haber, Terry; Foster, Clark B.; and Smedley, William H., to Habley Medical Technology Corporation. Shielded safety syringe. 4,892,523, Cl. 604-198.000.

Haber, Terry M., to Habley Medical Technology Corp. Single use, safety blood collection device. 4,892,107, Cl. 128-763.000.

Haber, Terry M., to Habley Medical Technology Corporation. Impact dissipating and load diverting total hip arthroplasty prosthesis. 4,892,551, Cl. 623-23.000.

Habibi, Farhad M., to Radiation Systems, Inc. Technical Products Division. Assembly system for maintaining reflector segments of an antenna in precision alignment. 4,893,132, Cl. 343-912.000.

Habley Medical Technology Corporation: *See—*
Haber, Terry; Foster, Clark B.; and Smedley, William H., 4,892,523, Cl. 604-198.000.
Haber, Terry M., 4,892,107, Cl. 128-763.000.
Haber, Terry M., 4,892,551, Cl. 623-23.000.

Hadzicki, Joseph R. Kite-like flying device with dual handles and four point control. 4,892,272, Cl. 244-153.00R.

Haertel, Georg: *See—*
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Hager, Juergen; and Vieth, Walter, to Magurit Gefrierschneider GmbH. Knife roller for an appliance for the precomminution of frozen material. 4,892,260, Cl. 241-282.200.

Hagglunds Denison Corporation: *See—*
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Hagner, George R., to Northern Telecom Limited. Circuit board and method of soldering. 4,893,216, Cl. 361-406.000.

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Derrien, Michel; Veaux, Jacques; and Hainaut, Jean-Pierre, 4,892,270, Cl. 244-104.00R.
Haisch, Mark E.: *See*—
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Hall, George V. B.; and Mallory, Charles W., to Westinghouse Electric Corp. Closure for casks containing radioactive materials. 4,893,022, Cl. 250-506.100.
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Hallerberg, Don. Twin-fluke marine anchor having loosely coupled flukes. 4,892,053, Cl. 114-303.000.
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Yanagi, Motonori; Hama, Masaharu; Hattori, Nobuyoshi; and Fukumoto, Takaaki, 4,893,320, Cl. 377-11.000.
Hamaguchi, Masami; Yanagihara, Hiromu; Hiraoka, Osamu; and Takahashi, Osamu, to Shiseido Company Limited; and Asia Can Company Limited. Metal container and method of manufacturing the same. 4,892,214, Cl. 220-67.000.
Hamburger Stahlwerke GmbH: *See*—
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Hamma, Kentaro: *See*—
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Hananoi, Toshihiro: *See*—
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Hanna, Stephen D.: *See*—
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Hara, Kazumasa: *See*—
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Hara, Zenichiro; Kobayashi, Masaaki; Tatsuda, Kazunori; Terazaki, Nobuo; and Iwata, Shuji, to Mitsubishi Denki Kabushiki Kaisha; and Ise Electronics Corporation. Fluorescent display apparatus. 4,893,056, Cl. 313-495.000.
Harada, Kosuke; Katsuki, Akihiko; and Tominaga, Fukutoshi, to Nishimu Electronics Industries Co., Ltd. Ferroresonant three-phase constant AC voltage transformer arrangement with compensation for unbalanced loads. 4,893,069, Cl. 323-215.000.
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Harbison, Kenneth G.; and Gaugh, Wilbur S., to Eastman Kodak Company. Photographic material protected against hydrogen cyanide gas. 4,892,808, Cl. 430-517.000.
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Harle, Anton, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Surgical aid. 4,892,516, Cl. 604-57.000.
Harmony, Dasiel C.; and Noble, Bradley T., to Engineering & Research Associates, Inc. Blood collection bag support. 4,892,668, Cl. 210-782.000.
Harnischfeger Corporation: *See*—
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Harpe, Richard L.: *See*—
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Harrap, Kenneth R., to Johnson Matthey Public Limited Company. Platinum chemotherapeutic product. 4,892,735, Cl. 424-435.000.
Harrasser, Hansjoerg: *See*—
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Harrington, Michael G.; Merril, Carl R.; Asher, David M.; and Gajdusek, D. Carleton, to United States of America, Health and Human Services. Method for distinguishing Creutzfeldt-Jakob disease from other dementias. 4,892,814, Cl. 435-5.000.
Harris Blake Corporation: *See*—
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Harris Corporation: *See*—
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Harrison, Anthony W., to Lucas Industries Public Limited Co. Disc brakes in vehicles. 4,892,173, Cl. 188-73.440.
Harrison, James. Automatic part-runner separator chute. 4,892,472, Cl. 425-139.000.
Hart, John A. Combination hoist and stand. 4,892,290, Cl. 254-49.000.
Hartney, Mark A.: *See*—
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Harvie, Philis A. Hair wrap device. 4,892,110, Cl. 132-273.000.
Hasebe, Kazunori: *See*—
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Haselton, E. Fletcher: *See*—
Andrews, Gerald W.; Dunnigan, William E.; Haselton, E. Fletcher; and Redwood, William J., 4,893,301, Cl. 370-58.200.
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Hashimoto, Masashi, to Texas Instruments Incorporated. Semiconductor memory system with programmable address decoder. 4,893,281, Cl. 365-230.060.
Hass, Robert H., to Union Oil Company of California. Gas treating process. 4,892,717, Cl. 423-217.000.
Hassler, William L., Jr.; and Shieh, Falin, to Parker Hannifin Corporation. Precision carriage and housing for relative position sensing device. 4,892,416, Cl. 384-58.000.
Hatakoshi, Genichi; Itaya, Kazuhiko; Naritsuka, Shigeya; Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Watanabe, Yukio; Ohba, Yasuo; Kokubun, Yoshihiro; and Uematsu, Yutaka, to Kabushiki Kaisha Toshiba. Semiconductor laser device which has a double-hetero structure having an optimal layer thickness. 4,893,313, Cl. 372-46.000.
Hatcher, Howard R. Brake light and radar detection device. 4,893,112, Cl. 340-479.000.
Hattich, Thomas: *See*—
Fischer, Wolfgang; Hattich, Thomas; Krug, William; and Schuster, Gerhard, 4,892,585, Cl. 106-38.220.
Hattori, Nobuyoshi: *See*—
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Hattori, Youichi: *See*—
Noguchi, Yoshiki; and Hattori, Youichi, 4,891,937, Cl. 60-39.182.
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Hawe, Malcolm; and Farrar, David, to Allied Colloids Limited. Polymeric thickeners and their production. 4,892,916, Cl. 526-304.000.
Hawkes, Gilbert E.; and Fisher, Susan, to Wilton Royal Carpets Limited. Doctor blade for doctoring a finish layer of PVC on a strip of carpet. 4,892,056, Cl. 118-126.000.
Hawkins, Richard A.: *See*—
Newman, Howard G.; Monette, David G.; Koczara, Michael D.; Ribant, Duane J.; Papke, Ronald D.; Bien, Alfred A.; and Hawkins, Richard A., 4,892,342, Cl. 292-347.000.
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Hayakawa, Youichi: *See*—
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Hayashi, Hideo; Murai, Hideya; and Inaba, Nobuyuki, to Idemitsu Petrochemical Co., Ltd. Process for producing aromatic polyester. 4,892,912, Cl. 525-437.000.
Hayashi, Shigeyuki: *See*—
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Hayashi, Sokichi, to Tamagawa Seiki Kabushiki Kaisha. Dynamically tuned gyro. 4,891,997, Cl. 74-5.460.
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Hayes, Rufus. Baseball gloves. 4,891,845, Cl. 2-19.000.
Hays, Paul B., to University of Michigan, The. Circle-to-line interferometer optical system. 4,893,003, Cl. 250-216.000.
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Haywood, Michael. Seat. 4,892,352, Cl. 297-195.000.
Hazelton, Lowell E., to Dow Chemical Company, The. Process for preparing an amorphous alloy body from mixed crystalline elemental metal powders. 4,892,579, Cl. 75-0.50B.
Hebert, Jacques, to Compagnie Generale des Etablissements Michelin-Michelin & Cie. Process for detecting anomalies by use of pressure and temperature measurements in a tire-monitoring device. 4,893,110, Cl. 340-442.000.
Heenan, Richard H.: *See*—
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Hefner, John G., to Dow Chemical Company, The. Catalysts prepared from tetrakis(dialkylamide or diarylamide) derivatives of titanium and polymerization of olefins therewith. 4,892,914, Cl. 526-114.000.
Hegasy, Ahmed, to Bayer Aktiengesellschaft. Processes for preparation of solid, rapidly released medicament preparations containing dihydropyridines. 4,892,730, Cl. 424-80.000.
Heidtmann, Denis L.: *See*—
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Hellmick, Mark; Johansson, Leif A.; and Weber, Otto, to Medrad, Inc. Film changer. 4,893,322, Cl. 378-173.000.
Hellwig, Harry; and Sturm, Klaus-Dietrich, to VEB Schwermaschinenbaukombinat Takraf. Jib system for cranes, especially mobile cranes. 4,892,201, Cl. 212-186.000.
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., to Telephone and Telegraph Company, AT&T Bell Laboratories. Arrangement for switching concentrated telecommunications packet traffic. 4,893,302, Cl. 370-60.000.
Hemmann, Siglinde: *See*—
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Henderson, David L.; Herbert, Brian K.; Lahey, Michael D.; and Robbins, Jamey L., to NCR Corporation. Logical drawing and transparency circuits for bit mapped video display controllers. 4,893,116, Cl. 340-747.000.
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Hennen, Harry A.: *See*—
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Herbert, Brian K.: *See*—
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Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Upgrading naphtha in a single riser fluidized catalytic cracking operation employing a catalyst mixture. 4,892,643, Cl. 208-70.000.
Hergert, Richard R.: *See*—
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Herman Hemscheidt Maschinenfabrik GmbH & Co.: *See*—
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Kolossow, Klaus-Dieter, 4,892,691, Cl. 264-54.000.
Hermann, William J., Jr.; and Zanek, John R., to Synertex. Hypodermic needle protective barrel and cap packaging. 4,892,525, Cl. 604-263.000.
Herold, Barry W.; and Tanernia, Omid, to Motorola, Inc. Frequency synthesizer with control of start-up battery saving operations. 4,893,094, Cl. 331-1.00A.
Herold, Barry W.: *See*—
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Hesse, Kurt. Toy vehicle with own motor drive. 4,892,502, Cl. 446-454.000.
Hester, Richard E.; and Wahl, Jerry R., to VTC Incorporated. Differential signal delay circuit. 4,893,036, Cl. 307-603.000.
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Stewart, Lowell J.; and Mebane IV, Alfred H., 4,893,066, Cl. 318-600.000.
Hey, John E.; Delago, Pierre C.; and Carlson, James A., to Amca International Corporation. Deepwater extended hook travel attachment. 4,892,202, Cl. 212-192.000.
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Weaver, Max A.; Pruett, Wayne P.; Hilbert, Samuel D.; and Coates, Clarence A., Jr., 4,892,923, Cl. 528-190.000.
Hildebrand, Rainer, to Ciba-Geigy Corporation. Process for the preparation of a n-alkylated bipyrazoleanthrone. 4,892,957, Cl. 548-357.000.
Hill, John B.; and Roczniak, Steven O., to Nutrasweet Company, The. Solvent system for enzymatic coupling process. 4,892,820, Cl. 435-68.100.
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Emerson, John D.; and Hill, Scott D., 4,892,039, Cl. 102-476.000.
Hill, Theodore L. Filtering system for fish ponds. 4,892,651, Cl. 210-151.000.
Himes, Glenn R., to Shell Oil Company. Elastomeric fibers, structures fashioned therefrom and elastomeric films. 4,892,903, Cl. 524-488.000.
Hine, Derek L. Wafer alignment and transport mechanism. 4,892,455, Cl. 414-417.000.
Hirabayashi, Keiji: *See*—
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.
Hirabayashi, Shigeto; Sato, Hirokazu; and Sakamoto, Eiichi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material excellent in treatment stability. 4,892,807, Cl. 430-505.000.
Hirai, Yuji, to Honda Tsushin Kogyo Co., Ltd. Flat-cable connector. 4,892,489, Cl. 439-497.000.
Hirai, Yutaka; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, to Canon Kabushiki Kaisha. Electroluminescent device. 4,893,154, Cl. 357-4.000.
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Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, to Tokyo Juki Industrial Co., Ltd. Automatic sewing machine exclusively used for sewing zipper on workpiece. 4,892,049, Cl. 112-265.200.

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Hirota, Yukitsugu: *See*—
Mihara, Teruyoshi; Hirota, Yukitsugu; Hiramoto, Yukio; and Matsushita, Tsutomu, 4,893,158, Cl. 357-23.130.

Hisazumi, Nobuyuki; Kahara, Keisuke; and Matsukura, Yoshihiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-shrinkable laminate film and process to produce the same. 4,892,765, Cl. 428-34.800.

Hitachi Chemical Co., Ltd.: *See*—
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Hitachi, Ltd.: *See*—
Inoue, Hisao; Hitomi, Ichiro; Sugimoto, Osamu; and Horita, Teiji, 4,892,419, Cl. 384-322.000.
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Matsumoto, Kunio; Oshima, Muneo; and Sakaguchi, Suguru, 4,893,172, Cl. 357-79.000.
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Miyake, Kiyoshi; Shintani, Akira; Suzuki, Keizo; and Miyazaki, Takao, 4,892,751, Cl. 427-34.000.
Miyazawa, Kazuyuki; Yamaguchi, Yasunori; and Kawamoto, Hiroshi, 4,893,157, Cl. 357-23.130.
Murakami, Tatsuya; Fujisawa, Hiromichi; Fujinawa, Masaaki; and Hananoi, Toshihiro, 4,893,188, Cl. 358-456.000.
Noguchi, Yoshiki; and Hattori, Youichi, 4,891,937, Cl. 60-39.182.
Ogushi, Tetsuya; Hakuraku, Yoshinori; and Ogata, Hisanao, 4,892,862, Cl. 505-1.000.
Shimizu, Hiroshi; Ozawa, Naohiro; Gotoh, Toshihiko; Hamma, Kentaro; and Nomura, Takeshi, 4,892,425, Cl. 400-120.000.
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, 4,892,423, Cl. 384-611.000.
Takahashi, Yoshikazu; Itoh, Tsuneo; and Takechi, Makoto, 4,893,168, Cl. 357-68.000.
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Urushiwara, Noriyoshi; Kobayashi, Noboru; and Kobayashi, Ryoichi, 4,893,215, Cl. 361-395.000.
Watanabe, Kenichi; Simada, Tamotu; Nagai, Keiichi; Tokita, Jirou; Nakano, Ryusei; and Sumitani, Tomoaki, 4,892,638, Cl. 204-299.00R.
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Hitachi Microcomputer Engineering, Ltd.: *See*—
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Hittite Microwave Corporation: *See*—
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Ho, Bernard W. K.: *See*—
Cheung, Robin W.; Ho, Bernard W. K.; Chen, Hsiang-Wen; and Chan, Hugo W. K., 4,892,844, Cl. 437-194.000.

Ho, W. S. Winston; and Sartori, Guido, to Exxon Research and Engineering Company. Addition of severely-hindered amine salts and/or aminoacids to non-hindered amine solutions for the absorption of H_2S. 4,892,674, Cl. 252-189.000.

Hoaglin, Christine L.: *See*—
Tennent, David L.; Fong, Gerald D.; and Hoaglin, Christine L., 4,892,857, Cl. 502-439.000.

Hobson, James C., to Cadillac Gage Textron Inc. Shaft lock assembly. 4,892,172, Cl. 188-69.000.

Hoch, Norman J.; and Rabin, Arno. Cutter and drive gear assembly for dressing welding electrode tips. 4,892,448, Cl. 409-181.000.

Hodgetts, Graham L., to Rolflor Industries, Inc. Unloading system for freight containers. 4,892,456, Cl. 414-527.000.

Hoechst AG: *See*—
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Hoechst Aktiengesellschaft: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; and Horstermann, Peter, 4,892,971, Cl. 562-450.000.
Wingen, Rainer; Guenther, Dieter; and Lingnau, Juergen, 4,892,799, Cl. 430-77.000.

Hoechst Celanese Corporation: *See*—
Choe, Eui W., 4,892,964, Cl. 558-414.000.
DeMartino, Ronald N.; Yoon, Hyun-Nam; and Stamatoff, James B., 4,892,682, Cl. 252-589.000.
Potvin, Robert E.; St. Alban, Jonas O.; and Sobodacha, Chester J., 4,892,801, Cl. 430-193.000.

Hoechst CeramTec Aktiengesellschaft: *See*—
Gradl, Reinhold; and Popp, Klaus, 4,892,498, Cl. 445-44.000.

Hoehn, Wolfgang, to Deutsche ITT Industries GmbH. Parallel analog to digital converter employing sample and hold stages. 4,893,122, Cl. 341-122.000.

Hoes, Larry M.; Cassity, Thomas G.; and Gullion, Steven D., to Cameron Iron Works USA, Inc. Method of securing a tubular member within an annular well member, the combined well structure and the tool. 4,892,149, Cl. 166-379.000.

Hoffman, Georg-Erich: *See*—
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Hoffman-La Roche Inc.: *See*—
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Hoffmann-La Roche Inc.: *See*—
Shah, Navnit H., 4,892,742, Cl. 424-480.000.

Hofgren Jon M. Bearing with composite load bearing surfaces. 4,892,421, Cl. 384-492.000.

Hogenkamp, Wilhelm, to Otto Hansel GmbH. Method and arrangement for orienting candies. 4,892,181, Cl. 198-434.000.

Holan, Leif A. Hinge. 4,891,862, Cl. 16-278.000.

Holland, Paul W. Weed cutter wheel kit. 4,891,931, Cl. 56-16.700.

Holmen, James O.: *See*—
Johnson, Robert G.; Holmen, James O.; and Ridley, Jeffrey A., 4,891,977, Cl. 73-204.260.

Holmes, Orie E. Method of forming high quality mold pin insert. 4,892,595, Cl. 148-12.00R.

Holster, Jesse L., to Exxon Production Research Company. Kerf-cutting apparatus and method for improved drilling rates. 4,892,159, Cl. 175-336.000.

Holt, Alyn R.; and Moore, Brian R., to inTEST Corporation. Electronic device testing system. 4,893,074, Cl. 324-158.00F.

Homandberg, Gene A.; and Wai, Thanda, to Abbott Laboratories. Process for the preparation of urokinase derivatives. 4,892,826, Cl. 435-183.000.

Homer, John C.; Nowshiravani, Shahriar; Ross, Steven L.; and Lutz, Gilbert F., to General Signal Corporation. Calorimetry system. 4,893,315, Cl. 374-37.000.

Homyk, William A. Radiation shielding apparatus. 4,893,023, Cl. 250-515.100.

Honda Electronic Co., Ltd.: *See*—
Honda, Keisuke, 4,893,045, Cl. 310-323.000.
Honda, Keisuke, 4,893,046, Cl. 310-323.000.
Honda, Keisuke, 4,893,047, Cl. 310-323.000.

Honda Giken Kogyo K.K.: *See*—
Ono, Jun; Iso, Yuichiro; and Ise, Hiroshi, 4,892,351, Cl. 296-213.000.
Tsuchiya, Yoshikazu; Kano, Hideki; Aihara, Yasuyuki; Miyazaki, Noboru; Suzuki, Izumi; and Ichida, Kiyofumi, 4,892,490, Cl. 439-533.000.

Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English): *See*—
Kishi, Noriyuki; Kubodera, Masao; and Akiyama, Eitetsu, 4,891,947, Cl. 60-602.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ban, Keisuke; and Daimaru, Akimasa, 4,892,130, Cl. 164-97.000.
Fukutomi, Yoji; Fukuzawa, Takeshi; and Kudo, Keisuke, 4,892,078, Cl. 123-489.000.
Iihoshi, Akira; Nakamura, Yukinobu; and Yasui, Shinichiro, 4,893,246, Cl. 364-449.000.
Inoue, Kazuo, 4,891,946, Cl. 60-602.000.
Okuda, Akihito; Katagiri, Yoshihiro; Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,891,944, Cl. 60-489.000.
Toshimits, Kazushige; Osawa, Keiichi; Umeda, Tadashi; and Noguchi, Kunio, 4,892,076, Cl. 123-442.000.
Yakuwa, Masahiko; Tomozawa, Kikuo; and Kishi, Kazuya, 4,892,077, Cl. 123-487.000.

Honda, Keisuke, to Honda Electronic Co., Ltd. Ultrasonic driving device. 4,893,045, Cl. 310-323.000.

Honda, Keisuke, to Honda Electronic Co., Ltd. Ultrasonic driving device. 4,893,046, Cl. 310-323.000.

Honda, Keisuke, to Honda Electronic Co., Ltd. Ultrasonic driving device. 4,893,047, Cl. 310-323.000.

Honda Tsushin Kogyo Co., Ltd.: *See*—
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Honeywell Inc.: *See*—
Dunaway, Thomas J.; Speilberger, Richard K.; Loy, Jerald M.; Dicks, Lori A.; and Balgaard, Luverne O., 4,892,245, Cl. 228-180.200.
Glenn, Max C., 4,891,985, Cl. 73-517.00R.
Johnson, Robert G.; Holmen, James O.; and Ridley, Jeffrey A., 4,891,977, Cl. 73-204.260.
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Honkomp, David J.: *See*—
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Honovich, Tito D. Condenser vent siphon line. 4,892,140, Cl. 165-110.000.

Hoover Group, Inc.: *See*—
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Hoover Universal, Inc.: *See*—
Powers, Thomas F.; and Kinslow, William G., 4,892,205, Cl. 215-1.00C.

Hoppe, Robert F.; West, Terence H.; and Cheng, Chun-Jer C., to Seagate Technology, Inc. Flexure mount for disc drives. 4,893,205, Cl. 360-104.000.

Horaguchi, Yoichi: *See*—
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Hori, Saburo, to Kureha Chemical Industry Co., Ltd. Tough corundum-rutile composite sintered body. 4,892,850, Cl. 501-127.000.

Horikawa, Yoshiaki, to Olympus Optical Co., Ltd. Scanning optical microscope. 4,893,008, Cl. 250-234.000.

Horita, Teiji: *See*—
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Horiuchi, Akihisa, to Canon Kabushiki Kaisha. Photographic lens having ghost image prevented from appearing. 4,892,397, Cl. 350-425.000.

Horiuchi, Takeshi; Sato, Yasuji; and Funato, Yasuo, to Kabushiki Kaisha Toshiba. System allowing selective connection of various types of external apparatuses to telephone set. 4,893,331, Cl. 379-93.000.

Horstermann, Peter: *See*—
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Horton, Robert L., to Phillips Petroleum Company. Recovering mineral values from ores. 4,892,715, Cl. 423-20.000.

Hoshino, Hiroo; and Shimada, Nobuyoshi, to Nippon Kayaku Kabushiki Kaisha. Method for inhibiting HIV and an pharmaceutical composition therefor. 4,892,876, Cl. 514-265.000.

Hosmer, Thomas P.: *See*—
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Houseman, Walter R. Projectile firing weapon with a replaceable firing mechanism actuator cassette. 4,891,898, Cl. 42-69.020.

Howard, Robert E.: *See*—
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Howells, Joseph A.; and Sweet, Alan F., to Dictaphone Corporation. Pause compression and reconstitution for recording/playback apparatus. 4,893,197, Cl. 360-8.000.

Howmedica GmbH: *See*—
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Hozer, James S.; and Gonder, Robert L., to Haworth, Inc. Top cap for panel. 4,891,922, Cl. 52-239.000.

Huang, Hua-Feng: *See*—
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Huang, Robert Y. M., to University of Waterloo. Novel membrane method. 4,892,661, Cl. 210-640.000.

Huang, Soddy. Revolving shaft controlled movable lamp stand. 4,892,278, Cl. 248-124.000.

Hubbell Incorporated: *See*—
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Hueber, William J.; Eder, Robert L.; and Cearlock, R. Keith, to Emhart Industries, Inc. Timing mechanism with improved clutch assembly. 4,892,982, Cl. 200-38.00R.

Huebsch, Donald L. Endoprosthesis device and method. 4,892,550, Cl. 623-22.000.

Huelster, David S., to General Motors Corporation. Oil system for gas turbine engine. 4,891,934, Cl. 60-39.080.

Huff, John E. Polishing method. 4,892,612, Cl. 156-636.000.

Huff, Stanley M.: *See*—
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Hugo, Schilling; Veith, Gunter; and Marcel, Zund, to Sulzer Brothers Limited. Changing cloth beams in a weaving mill. 4,892,119, Cl. 129-1.00R.

Hull, Ezekiel H.; and Frappier, Edward P., to Morflex Chemical Company, Inc. Citrate esters. 4,892,967, Cl. 560-180.000.

Humberstone, Victor C.; Pettigrew, Robert M.; and Helfet, Peter R. Magneto-optic data storage technique. 4,893,299, Cl. 369-275.000.

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Hunting Oilfield Services Limited: *See*—
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Ichihashi, Mitsuyoshi: *See*—
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Ichikawa, Masaharu. Internal combustion type iron. 4,892,086, Cl. 126-409.000.

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Iihoshi, Akira; Nakamura, Yukinobu; and Yasui, Shinichiro, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for displaying travel path. 4,893,246, Cl. 364-449.000.

Iino, Tadashi: *See*—
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Inoue, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for control of operational characteristics of supercharger in internal combustion engine. 4,891,946, Cl. 60-602.000.

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InterMetro Industries Corporation: *See—*
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Iorlano, Alfred. Golf hand pad device. 4,892,315, Cl. 273-166.000.

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Iriyama, Masahiro, to Nissan Motor Company, Limited. Spark ignition timing control system for internal combustion engine. 4,892,074, Cl. 123-425.000.

Iriyama, Masahiro; and Satoh, Hiroshi, to Nissan Motor Co., Ltd. Crank angle detecting system for internal combustion engines. 4,892,075, Cl. 123-425.000.

Ise Electronics Corporation: *See—*
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Ishibashi, Kiyoshi, to Aisin Seiki Kabushiki Kaisha. Refrigerstion system. 4,891,951, Cl. 62-51.300.

Ishibashi, Kouichirou: *See—*
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Ishida, Hiroaki; Shinozaki, Nobuo; and Nishitani, Yasuhiro, to Seikosha Co., Ltd. Device for activating motor-driven shutter blades. 4,893,142, Cl. 354-234.100.

Ishida, Kazuhito: *See—*
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Ishida, Koichi: *See—*
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Ishida, Noboru, to Nippon Oil Co., Ltd. Synthetic lubricating oils and specified naphthalene derivatives for use therein. 4,892,680, Cl. 252-565.000.

Ishida, Tsuyoshi: *See—*
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Ishiguro, Kuniaki; and Ishikawa, Takuma, to Minolta Camera Kabushiki Kasha. Copying apparatus having a sorter with a sheet binding function. 4,893,152, Cl. 355-323.000.

Ishii Hyoki Co., Ltd.: *See—*
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Ishii, Takatoshi, to ASCII Corporation. Image data processing system. 4,893,114, Cl. 340-703.000.

Ishii, Toshihiro, to Ishii Hyoki Co., Ltd. Membrane panel switch. 4,892,988, Cl. 200-516.000.

Ishii, Yutaka, to Sanden Corporation. Heat exchanger. 4,892,143, Cl. 165-152.000.

Ishikawa, Hsao: *See—*
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Ishikawa, Masayuki: *See—*
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Isobe, Nobuyuki: *See—*
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Isobe, Tsuneo: *See—*
Yasui, Toshihiro; Sugita, Masanori; and Isobe, Tsuneo, 4,892,164, Cl. 180-68.300.

Isono, Kazuaki, to Mitsubishi Denki Kabushiki Kaisha. Control device for an air conditioner with floor temperature sensor. 4,891,953, Cl. 62-209.000.

Isozumi, Shuzoo; and Yagi, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Engine starter having planet reduction gear mechanism. 4,891,996, Cl. 74-6.000.

Isuzu Motors Limited: *See—*
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Italpack S.p.A.: *See—*
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Itano, Kiyoshi; and Shimbayashi, Kohji. Programmable logic array having input transition detection for generating precharge. 4,893,033, Cl. 307-465.000.

Itaya, Kazuhiko: *See—*
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Ito, Akira, to Hitachi, Ltd. Semiconductor memory device including precharge/equalization circuitry for the complementary data lines. 4,893,278, Cl. 365-203.000.

Ito, Meiichi; Kuriyagawa, Kazuya; Adachi, Hitoshi; and Ohno, Kohei, to Nihon Kohden Corp. Apparatus for inspecting an electrically stimulated heart. 4,892,104, Cl. 128-697.000.

Ito, Mineo: *See—*
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Ito, Shigeru: *See—*
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Ito, Shinichi; and Kaneda, Hirokazu, to Fuji Electric Co., Ltd. Method of manufacturing a semiconductor device with polysilicon resistors and field plate. 4,892,839, Cl. 437-47.000.

Ito, Susumu: *See—*
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.

Ito, Takanori, to Ricoh Company Ltd. Digital color copying machine. 4,893,179, Cl. 358-79.000.

Ito, Toshiyuki: *See—*
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Ito, Yasuo: *See*—
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Ito, Yoshio: *See*—
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Itoh, Kiichi; and Shibano, Takeshi, to Mitsubishi Petrochemical Company Limited; and Uni-Charm Corporation. Process for preparation of water absorptive composite material. 4,892,754, Cl. 427-54.100.

Itoh, Osamu: *See*—
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Itoh, Tetsuroh, to Mitsubishi Denki Kabushiki Kaisha. Discharge machining apparatus having means for distinguishing abnormal interelectrode gap conditions. 4,892,989, Cl. 219-69.130.

Itoh, Tsuneo: *See*—
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Itoh, Yoshiaki: *See*—
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ITT Corporation: *See*—
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Itzel, Hanshelmut; Dewenter, Manfred; and Henke, Siegfried, to Shell International Research Maatshappij B. V. Stabilized pesticidal composition. 4,892,866, Cl. 514-119.000.

Iwami, Etsuji: *See*—
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Iwaoka, Hideto; Ohte, Akira; and Akiyama, Koji, to Yokogawa Electric Corporation. Optical frequency synthesizer/sweeper. 4,893,353, Cl. 455-612.000.

Iwaosa, Katsuaki: *See*—
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Iwase, Taira; Ariizumi, Shoji; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Method of manufacturing a read only semiconductor memory device. 4,892,841, Cl. 437-52.000.

Iwata, Shuji: *See*—
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Izumi, Hirohumi: *See*—
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Sawamoto, Takeyuki; Ishida, Koichi; Tarumi, Niro; and Izumitani, Tetsuro, 4,892,402, Cl. 351-160.00H.

J. I. Case Company: *See*—
Brown, Thomas R.; and Morrow, Daniel D., 4,892,158, Cl. 172-443.000.
Scott, Leonard A., 4,891,999, Cl. 74-337.500.

J. M. Voith GmbH: *See*—
Beisswanger, Rudolf, 4,892,263, Cl. 242-58.300.

J. N. Fauver Company: *See*—
Riley, Ron, 4,892,980, Cl. 191-14.000.

J. S. Staedtler GmbH & Co.: *See*—
Grotsch, Gerald, 4,892,428, Cl. 401-258.000.

Jaatinen, Paavo: *See*—
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.

Jackson, Winslow E., to Pitney Bowes Inc. System for securely controlling postage funds. 4,893,000, Cl. 235-380.000.

Jacob, Lutz E.: *See*—
Lepert, Andre; Evans, Morris L.; and Jacob, Lutz E., 4,892,905, Cl. 524-499.000.

Jaffe, Edward E.; von der Crone, Jost; and Medinger, Bernhard, to Ciba-Geigy Corporation. Novel compositions based on tetrachloroisoindolinone pigments. 4,892,899, Cl. 524-83.000.

Jager, Andreas; and Rohrs, Friederich, to Jager, Arnold. Belt with rods for a rod belt conveyor. 4,892,509, Cl. 474-237.000.

Jager, Arnold: *See*—
Jager, Andreas; and Rohrs, Friederich, 4,892,509, Cl. 474-237.000.

Jaggy, Hermann E. W.: *See*—
Chatterjee, Shyam S.; Gabard, Benard L.; and Jaggy, Hermann E. W., 4,892,883, Cl. 514-464.000.

James, David E.: *See*—
Schroeder, Hobe; and James, David E., 4,892,972, Cl. 562-487.000.

James, Jimmie J.; and James, Susanna M. Lottery ticket reviewing device. 4,892,313, Cl. 273-148.00R.

James, Robert C.; Kovacs, Lloyd; and Lind, Matthew R., to Hayssen Manufacturing Company. Carton loading machine. 4,891,928, Cl. 53-250.000.

James, Susanna M.: *See*—
James, Jimmie J.; and James, Susanna M., 4,892,313, Cl. 273-148.00R.

Jamzadeh, Fereidoon S., to Eastman Kodak Company. Laser printer with position registration enhancement. 4,893,135, Cl. 346-108.000.

Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., to Motorola, Inc. Digital radio frequency receiver. 4,893,316, Cl. 375-44.000.

Jane, S.A.: *See*—
Cabagnero, Ramon J., 4,892,327, Cl. 280-650.000.

Janome Sewing Machine Company Limited: *See*—
Ando, Takumi; Toyomi, Toshitaka; and Osanai, Yasuhiro, 4,892,050, Cl. 112-458.000.
Karuga, Noboru; Hara, Kazumasa; Koike, Mikio; and Nishijima, Mitsuru, 4,892,048, Cl. 112-254.000.

Jansche, Walter: *See*—
Bollweber, Lothar; Jansche, Walter; Hugel, Robert; Pilch, Claus-Dietrich; Rothley, Manfred; and Zabler, Erich, 4,891,973, Cl. 73-146.500.

Jantzen, Eric, to Gefitec S.A. Storage cabinet with pivoting storage compartments. 4,892,367, Cl. 312-328.000.

Janzen, Erik; and Tenghamn, Rune, to AB ASEA-Atom. System and method for self-compensating fiber-optic data transmission at temperatures up to 200 degrees C. 4,893,354, Cl. 455-612.000.

Jaouen, Claude: *See*—
Magnin, Guy; Champeaud, Marie-Francoise; Aubert, Veronique; and Jaouen, Claude, 4,892,685, Cl. 252-628.000.

Japan Atomic Energy Research Institute: *See*—
Katagiri, Masaki, 4,893,016, Cl. 250-370.090.

Jarrett, Robert B.: *See*—
Bynum, Byron G.; and Jarrett, Robert B., 4,893,211, Cl. 361-18.000.

Jasper, Steven C.: *See*—
Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., 4,893,316, Cl. 375-44.000.

Jaspering, Daniel L.: *See*—
Nagy, Joseph G.; and Jaspering, Daniel L., 4,891,938, Cl. 60-245.000.

Jelinek, Vaclav, to SSMC Inc. Suction table assembly. 4,892,296, Cl. 269-21.000.

Jenkins, Solomon, III: *See*—
Davis, Donald H.; Kure-Jensen, Jens; and Jenkins, Solomon, III, 4,892,118, Cl. 137-625.300.

Jenkins, William D.: *See*—
Rhoades, Lawrence J.; and Jenkins, William D., 4,891,916, Cl. 51-230.000.

Jennings, Alfred R., Jr.; and Stowe, Lawrence R., to Mobil Oil Corporation. Hydraulic fracturing utilizing a refractory proppant. 4,892,147, Cl. 166-280.000.

Jennings, Kenneth L. Golf ball storage, dispensing and teeing apparatus. 4,892,318, Cl. 273-201.000.

Jennings, Ryan. Braking system for roller skis. 4,892,332, Cl. 280-842.000.

Jensen, Finn: *See*—
Tragardh, Jan; Jonsson, Bjarne; and Jensen, Finn, 4,893,344, Cl. 381-187.000.

Jensen, Klaus G.; and Bregnedal, Peter, to H. Lundbeck A/S. Oleic acid esters and pharmaceutical compositions. 4,892,878, Cl. 514-327.000.

Jerome, Henry. Cooking spits. 4,892,032, Cl. 99-421.0HV.

Jester, Donald J.: *See*—
Pankonen, Andrew W.; Jester, Donald J.; Mulrow, Robert J.; Modica, Catherine P.; and Zdenek, John M., 4,893,325, Cl. 379-45.000.

Jet-R Limited: *See*—
Bick, Peter A.; and Kinnell, Christine J., 4,893,291, Cl. 368-10.000.

Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Isii, Yosimori, 4,893,039, Cl. 310-89.000.

Joe Cooling & Sons Inc.: *See*—
Cooling, Eugene D.; and Cooling, Timothy M., 4,892,153, Cl. 172-20.000.

Johansson, Leif A.: *See*—
Hellmick, Mark; Johansson, Leif A.; and Weber, Otto, 4,893,322, Cl. 378-173.000.

John Fluke Mfg. Co., Inc.: *See*—
Blanchard, Randall D., 4,893,115, Cl. 340-712.000.

John Mezzalingua Assoc. Inc.: *See*—
Szegda, Andrew, 4,892,275, Cl. 248-61.000.

Johnson, Barry J.: *See*—
Dickson, Charles R.; Johnson, Barry J.; and Gerhardt, David B., 4,892,592, Cl. 136-244.000.

Johnson, Barry T. Article display apparatus. 4,892,198, Cl. 211-41.000.

Johnson Electric Industrial Manufactory Limited: *See*—
Baines, Roger F., 4,893,043, Cl. 310-239.000.

Johnson, Gerald R.; Jones, Edward C., Jr.; and Jones, Milo C., to Jones Dairy Farm. Method of manufacturing a reduced calorie sausage containing cooked rice. 4,892,749, Cl. 426-646.000.

Johnson & Johnson: *See*—
Farrington, Allan P.; and Marshall, Gerald M., 4,892,470, Cl. 425-80.100.

Johnson, Karle J.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,893,317, Cl. 375-97.000.

Johnson, Mark: *See*—
Guerra, Carlos; Lee, John; and Johnson, Mark, 4,892,700, Cl. 264-510.000.

Johnson Matthey Public Limited Company: *See*—
Harrap, Kenneth R., 4,892,735, Cl. 424-435.000.

Johnson, Robert G.; Holmen, James O.; and Ridley, Jeffrey A., to Honeywell Inc. Microbridge sensor bonding pad design for improved adhesion. 4,891,977, Cl. 73-204.260.

Johnson, Theodore D., II. Word game. 4,892,319, Cl. 273-272.000.

Johnson, William A. Grain-saver dam for combine cutter bar. 4,891,932, Cl. 56-158.000.

Johnson, William C., to Rand Farm Systems Inc.; and Poly Farm, Inc., a part interest. Bag and tube folding method and apparatus. 4,892,514, Cl. 493-413.000.

Johnston, William D.: *See*—
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 4,892,604, Cl. 156-244.240.

Jokinen, Juhani: *See*—
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.

Jones, Brian E., to Lilly Industries Limited. Capsules. 4,892,766, Cl. 428-36.400.

Jones, Charles R.: *See*—
Meyers, Richard S.; and Jones, Charles R., 4,892,001, Cl. 74-477.000.

Jones Dairy Farm: *See*—
Johnson, Gerald R.; Jones, Edward C., Jr.; and Jones, Milo C., 4,892,749, Cl. 426-646.000.

Jones, Edward C., Jr.: *See*—
Johnson, Gerald R.; Jones, Edward C., Jr.; and Jones, Milo C., 4,892,749, Cl. 426-646.000.

Jones, Franklin B.: *See*—
Milberger, Walter E.; Kerfoot, Charles S.; and Jones, Franklin B., 4,893,070, Cl. 323-270.000.

Jones, John W. D.; and O'Sullivan, Peter F., to Smiths PLC. Engine monitoring apparatus. 4,891,971, Cl. 73-117.300.

Jones, Larry L.: *See*—
Goldstein, Michel; Howton, Kenneth D.; and Jones, Larry L., 4,893,106, Cl. 337-159.000.

Jones, Milo C.: *See*—
Johnson, Gerald R.; Jones, Edward C., Jr.; and Jones, Milo C., 4,892,749, Cl. 426-646.000.

Jonsson, Bjarne: *See*—
Tragardh, Jan; Jonsson, Bjarne; and Jensen, Finn, 4,893,344, Cl. 381-187.000.

Jorgensen, Robert W., to Hubbell Incorporated. Ceiling Boxes for ceiling fan support. 4,892,211, Cl. 220-3.200.

Joss, Michael S.: *See*—
Yuan, Arthur H.; and Joss, Michael S., 4,892,517, Cl. 604-74.000.

Jost, Max; Burdeska, Kurt; and von der Crone, Jost, to Ciba-Geigy Corporation. Isoindoline pigments containing at least one triazolopyrimidone radical. 4,892,945, Cl. 544-263.000.

K-Tron International, Inc.: *See*—
Kalata, Paul R., 4,893,262, Cl. 364-567.000.

Kabushiki Kaisha AG: *See*—
Okamoto, Zenjiro, 4,892,384, Cl. 350-145.000.

Kabushiki Kaisha Kaneda Kikai Seisakusho: *See*—
Sano, Shozo, 4,892,610, Cl. 156-446.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Miyzawa, Yukimori, 4,893,038, Cl. 310-83.000.

Kabushiki Kaisha Taito: *See*—
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Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Takeuchi, Noboru; Goto, Masakazu; Takahashi, Hiroaki; and Kojima, Takeshi, 4,892,387, Cl. 350-319.000.

Kabushiki Kaisha Toshiba: *See*—
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Hatakoshi, Genichi; Itaya, Kazuhiko; Naritsuka, Shigeya; Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Watanabe, Yukio; Ohba, Yasuo; Kokubun, Yoshihiro; and Uematsu, Yutaka, 4,893,313, Cl. 372-46.000.
Horiuchi, Takeshi; Sato, Yasuji; and Funato, Yasuo, 4,893,331, Cl. 379-93.000.
Iwase, Taira; Ariizumi, Shoji; and Masuoka, Fujio, 4,892,841, Cl. 437-52.000.
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Koshiyouji, Takashi; and Ishida, Tsuyoshi, 4,893,196, Cl. 358-474.000.
Masuda, Eiji, 4,893,031, Cl. 307-451.000.
Matsuo, Ryosuke; and Koyanagi, Masaru, 4,893,029, Cl. 307-296.400.
Nakamura, Sadao, 4,893,303, Cl. 370-60.000.
Nishiwaki, Satoru; Takahashi, Yukinobu; Murakami, Kouji; and Fukuda, Norisuke, 4,893,214, Cl. 361-286.000.
Ogasawara, Tatsuo, 4,892,103, Cl. 128-660.010.
Ono, Katsuhiro, 4,893,020, Cl. 250-483.100.
Saitou, Satoshi, 4,893,018, Cl. 250-370.100.
Sakuragi, Hiroshi, 4,893,258, Cl. 364-521.000.
Shimaoka, Kouichi; and Iizuka, Matoi, 4,893,232, Cl. 364-200.000.
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Tachibana, Natsuki; Toshimitsu, Kenshi; and Ichihara, Issey, 4,893,146, Cl. 355-315.000.
Takekado, Shigeru, 4,892,174, Cl. 188-378.000.
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Tanaka, Sumio; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Imamiya, Keniti, 4,893,275, Cl. 365-189.090.
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Tsujimoto, Shuichi; and Asada, Haruo, 4,893,187, Cl. 358-261.100.
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Utsumi, Isao; Kawai, Yasuhiro; Tamura, Kaoru; Maehara, Yasunori; Fujiwara, Sigeme; and Koyama, Katsuhide, 4,892,199, Cl. 211-51.000.
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Kabushiki Kaisha Tsuchiya Seisakusho: *See*—
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Kaeriyama, Kyoji: *See*—
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,892,678, Cl. 252-500.000.

Kaeser, Ernst. Guided running belt over massage rollers having varying projections. 4,892,090, Cl. 128-58.000.

Kageyama, Hiroshi: *See*—
Soichi, Hara; and Kageyama, Hiroshi, 4,891,875, Cl. 29-156.50R.

Kagstrom, Per-Olof, to Granges Aluminium Aktiebolag. Device for liquid pumping. 4,892,294, Cl. 266-233.000.

Kahara, Keisuke: *See*—
Hisazumi, Nobuyuki; Kahara, Keisuke; and Matsukura, Yoshihiro, 4,892,765, Cl. 428-34.800.

Kairi, Matti O.; and Lehtonen, Markku S., to Metsaliiton Teollisuus OY. Joint for connecting wooden beams to each other, and the use of the joint in roof truss structures. 4,891,927, Cl. 52-642.000.

Kajigaya, Kazuhiko; and Sato, Katsuyuki, to Hitachi, Ltd. Semiconductor memory. 4,893,277, Cl. 365-203.000.

Kakidaira, Susumu, to Koito Manufacturing Co., Ltd. High-mounted stoplight for motor vehicle. 4,893,220, Cl. 362-80.100.

Kalata, Paul R., to K-Tron International, Inc. Weigh feeding system with self-tuning stochastic control. 4,893,262, Cl. 364-567.000.

Kamitaka, Masuo: *See*—
Yoshikawa, Masaharu; Sugimoto, Kazuo; Kamitaka, Masuo; Takagi, Shinya; and Yoshida, Hiroyuki, 4,891,952, Cl. 62-199.000.

Kammerer, Heinz; and Stumpe, Reinhard, to Gebhard Balluff Fabrik Feinmechanischer Erzeugnisse GmbH & Co. Proximity switch insensitive to interference fields. 4,893,027, Cl. 307-116.000.

Kamp, Winfried: *See*—
Knauer, Karl; and Kamp, Winfried, 4,893,269, Cl. 364-784.000.

Kamyr AB: *See*—
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Kanatani, Yoshiharu: *See*—
Ohba, Toshihiro; Kanatani, Yoshiharu; and Uede, Hisashi, 4,893,060, Cl. 315-169.300.

Kaneda, Hirokazu: *See*—
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Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Fujiwara, Ryoji; Yamaguchi, Minori; and Shimizu, Isamu, 4,892,594, Cl. 136-258.000.

Kanner, Rowland W.: *See*—
Ranalletta, Joseph V.; and Kanner, Rowland W., 4,892,097, Cl. 606-182.000.

Kanno, Takayuki: *See*—
Maeda, Tsutomu; Matsui, Kiyoshi; Kanno, Takayuki; and Sato, Kunihiro, 4,893,105, Cl. 336-84.00M.

Kano, Hideki: *See*—
Tsuchiya, Yoshikazu; Kano, Hideki; Aihara, Yasuyuki; Miyazaki, Noboru; Suzuki, Izumi; and Ichida, Kiyofumi, 4,892,490, Cl. 439-533.000.

Kansai Electric Co., Inc., The: *See*—
Inoue, Hisao; Hitomi, Ichiro; Sugimoto, Osamu; and Horita, Teiji, 4,892,419, Cl. 384-322.000.

Kanzaki Kokyukoki Mfg. Co. Ltd.: *See*—
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Kapela, Zenon: *See*—
von Zelewski, Andreas; and Kapela, Zenon, 4,892,225, Cl. 220-408.000.

Karasawa, Hiroyuki: *See*—
Agano, Toshitaka; Furue, Ryousuke; Karasawa, Hiroyuki; and Miyagawa, Ichirou, 4,893,012, Cl. 250-327.200.

Karasawa, Shinji, to Miyage National College of Technology. Mos fet Device. 4,893,156, Cl. 357-23.100.

Kariya and Toyota Jidosha Kabushiki Kaisha: *See*—
Kozaki, Tetsuji; Shimamoto, Mamoru; and Oonuma, Toshio, 4,892,329, Cl. 280-772.000.

Karkouti, Imad. Remote control system for operating selected functions of a vehicle. 4,893,240, Cl. 364-424.050.

Karloske, Joan E.: *See*—
Leitheiser, Robert H.; and Karloske, Joan E., 4,892,919, Cl. 528-48.000.

Karol, Frederick J.: *See*—
Cann, Kevin J.; Karol, Frederick J.; Lee, Kiu H.; and Marcinkowsky, Arthur E., 4,892,853, Cl. 502-112.000.

Karr, Robert F.: *See*—
Thomas, David A.; Karr, Robert F.; and Davies, Patricia K., 4,892,412, Cl. 366-145.000.

Karsner, Grant G.: *See*—
Choi, Byung; C.; Karsner, Grant G.; Lee, Chang-Kuei; Malladi, Madhava; and Milstein, Donald, 4,892,644, Cl. 208-107.000.

Karuga, Noboru; Hara, Kazumasa; Koike, Mikio; and Nishijima, Mitsuru, to Janome Sewing Machine Co., Ltd. Automatic thread tightening device for a sewing machine. 4,892,048, Cl. 112-254.000.

Kasahara, Akihisa: *See*—
Suzuki, Yoshiyuki; Ohtsuka, Tatsumi; Iino, Tadashi; Kasahara, Akihisa; and Tomiyama, Noriyasu, 4,892,386, Cl. 350-174.000.

Kasai, Kazumi, to Yoshida Kogyo K. K. Buckle of synthetic resin. 4,891,866, Cl. 24-170.000.

Kase, Masao: *See*—
Matsuura, Ryo; Isobe, Nobuyuki; and Kase, Masao, 4,893,295, Cl. 369-75.200.

Kasenga, Anthony F.; Gray, Leslie F.; Henson, Thomas L.; and MacInnis, Martin B., to GTE Products Corporation. Method for a produc-

ing manganese activated zinc silicate phosphor. 4,892,757, Cl. 427-215.000.

Kashihara, Tadashi, to Shimpo Kogyo Kabushiki Kaisha. Automatic transmissions of vehicle. 4,892,012, Cl. 74-772.000.

Kashiwabara, Toshiyuki: *See*—
Wakai, Toshiyuki; and Kashiwabara, Toshiyuki, 4,893,006, Cl. 250-227.000.

Kastelic, John R.: *See*—
Gerlowski, Leonard E.; and Kastelic, John R., 4,892,697, Cl. 264-234.000.

Katagiri, Masaki, to Japan Atomic Energy Research Institute. Gas-cooled semiconductor radiation detector. 4,893,016, Cl. 250-370.090.

Katagiri, Yoshihiro: *See*—
Okuda, Akihito; Katagiri, Yoshihiro; Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,891,944, Cl. 60-489.000.

Katahira, Masayuki, to Nippon Seiko Kabushiki Kaisha. Miniature linear guide apparatus. 4,892,415, Cl. 384-45.000.

Kataoka, Jiro: *See*—
Asada, Takafumi; Kataoka, Jiro; and Nakagawa, Kouji, 4,892,418, Cl. 384-124.000.

Katase, Shunichi: *See*—
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Kato, Kouichi: *See*—
Yamamoto, Noboru; Tsujimura, Masakuni; Sasaki, Kiyotaka; Kato, Kouichi; Tani, Hideji; Ito, Yasuo; Matsui, Takeshi; and Hashimoto, Kenji, 4,892,073, Cl. 123-417.000.

Kato, Yoichiro; Takao, Hiroyuki; Koga, Yasuhide; and Takashima, Tsuguro, to Nippon Steel Corporation. Brick casting method of making a stave cooler. 4,892,293, Cl. 266-193.000.

Katsuki, Akihiko: *See*—
Harada, Kosuke; Katsuki, Akihiko; and Tominaga, Fukutoshi, 4,893,069, Cl. 323-215.000.

Katz, Manfred: *See*—
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Kaucic, Edward M.: *See*—
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Kaule, Wittich; Moll, Jurgen; Schwenk, Gerhard; and Stenzel, Gerhard, to GAO Gesellschaft fuer Automation und Organisation mbH. Antifalsification document having a security thread embedded therein and a method for producing the same. 4,892,336, Cl. 283-91.000.

Kawa, Rolf; Tesmann, Holger; Wilhelm, Josef; Rose, Karl-Heinz; and Konrad, Eugen, to Henkel Kommanditgesellschaft auf Aktien. Pumpable cationic fatty alcohol despersion. 4,892,728, Cl. 424-70.000.

Kawaguchi, Takashi; Fujita, Yoshiaki; and Kawai, Satoshi, to Nippon Piston-Ring Co., Ltd. Ultrasonic joint inspection device and method. 4,891,972, Cl. 73-119.00R.

Kawahara, Eiichiro: *See*—
Okuda, Akihito; Katagiri, Yoshihiro; Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,891,944, Cl. 60-489.000.

Kawai, Makoto; Hayashi, Chikahisa; Hirose, Yoshikazu; and Terayama, Tatsuya, to Toyoda Gosei Co., Ltd. Liquid level gauge. 4,891,980, Cl. 73-290.00R.

Kawai, Satoshi: *See*—
Kawaguchi, Takashi; Fujita, Yoshiaki; and Kawai, Satoshi, 4,891,972, Cl. 73-119.00R.

Kawai, Yasuhiro: *See*—
Utsumi, Isao; Kawai, Yasuhiro; Tamura, Kaoru; Maehara, Yasunori; Fujiwara, Sigeme; and Koyama, Katsuhide, 4,892,199, Cl. 211-51.000.

Kawai, Yoshihiko; Koyama, Kazuaki; and Yasuda, Isao, to Sanyo Electric Co., Ltd. Method of making a magnetic head. 4,891,878, Cl. 29-603.000.

Kawajiri, Tatsuya; Uchida, Shinichi; and Wada, Masahiro, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst for oxidation of acrolein and process for preparation thereof. 4,892,856, Cl. 502-247.000.

Kawakita, Takeshi: *See*—
Tahara, Tetsuya; Kawakita, Takeshi; Yasumoto, Mitsuyoshi; and Fukuda, Takemi, 4,892,872, Cl. 514-230.500.

Kawamoto, Hiroshi: *See*—
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Kawamoto, Satoru: *See*—
Morino, Seiji; Kawamoto, Satoru; Yoshitani, Yoshihiro; Sugimoto, Toshio; and Nariki, Toshio, 4,892,080, Cl. 123-604.000.

Kawamura, Hideo, to Isuzu Motors Limited. Apparatus for controlling combustion in heater. 4,892,476, Cl. 431-36.000.

Kawamura, Katsumi: *See*—
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, 4,892,423, Cl. 384-611.000.

Kawar, Ibrahim M. Electrical hand steadiness testing game. 4,892,306, Cl. 273-1.0GA.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tamba, Shinichi; and Miyake, Hitomi, 4,891,940, Cl. 60-320.000.

Kawaura, Hiroyuki: *See*—
Arai, Tohru; Takeda, Hiromasa; and Kawaura, Hiroyuki, 4,892,759, Cl. 427-249.000.

Kawchak, David B.: *See*—
Gieske, Detlef J.; and Kawchak, David B., 4,891,897, Cl. 40-618.000.

Kaydon Corporation: *See*—
Parker, Matt, III; Blom, Michael D.; and Miller, Roger K., 4,892,667, Cl. 210-799.000.

KCL Corporation: *See*—
Branson, Mark, 4,892,512, Cl. 493-194.000.

Keese, Charles R.: *See*—
Abramowicz, Daniel A.; and Keese, Charles R., 4,892,822, Cl. 435-132.000.

Kelland, John W.: *See*—
Sampson, Roy J.; Kelland, John W.; and Kiff, Frank T., 4,892,852, Cl. 502-107.000.

Keller, Jeanne N. Paper cutting assist. 4,892,295, Cl. 269-8.000.

Kelrick, Joseph. Adjustable hanger. 4,892,284, Cl. 248-476.000.

Kemp, Paul: *See*—
Long, Michael; Palone, Thomas W.; and Kemp, Paul, 4,892,243, Cl. 226-97.000.

Kempchen & Co. GmbH: *See*—
Tuckmantel, Hans-Joachim, 4,892,320, Cl. 277-125.000.

Kennedy, T. W.; and McMillen, James C. Automotive fuel system adjustment tool. 4,892,017, Cl. 81-492.000.

Kenoyer, Michael L.: *See*—
Duran, Joe W.; Kenoyer, Michael L.; Cooper, Edward H., Jr.; and Maeng, JoonYoul, 4,893,326, Cl. 379-53.000.

Kerfoot, Charles S.: *See*—
Milberger, Walter E.; Kerfoot, Charles S.; and Jones, Franklin B., 4,893,070, Cl. 323-270.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Steudle, Ernst; Boling, Gerd; and Zillikens, Josef, 4,891,968, Cl. 73-64.300.

Kerscher, Lorenz; Pautz, Brigitte; Trunk, Gisela; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Process and reagent for the specific determination of the cholesterol of the HDL fraction. 4,892,815, Cl. 435-7.000.

Keys, Robert O., to Sherex Chemical Company, Inc. Coal filtration process and dewatering aids therefor. 4,892,663, Cl. 210-729.000.

Khalifa, Mohamed; and Manwell, John, to Schlumberger Industries, Inc. Vortex flowmeter transducer. 4,891,990, Cl. 73-861.240.

Kida, Toshio: *See*—
Murakami, Takatoshi; Kida, Toshio; Kon, Shiji; Asai, Toshinobu; and Nunome, Yoshiyuki, 4,892,696, Cl. 264-219.000.

Kiefer, Edward D., to Kiefer, Gerald M., a part interest. Screed rail system. 4,892,439, Cl. 404-119.000.

Kiefer, Gerald M.: *See*—
Kiefer, Edward D., 4,892,439, Cl. 404-119.000.

Kiekert GmbH & Co. Kommanditgesellschaft: *See*—
Kleefeldt, Frank; and Menke, Hans T., 4,892,339, Cl. 292-201.000.

Kiff, Frank T.: *See*—
Sampson, Roy J.; Kelland, John W.; and Kiff, Frank T., 4,892,852, Cl. 502-107.000.

Kijima, Mitsutoshi, to Mazda Motor Corporation. Automobile underbody structure. 4,892,350, Cl. 296-204.000.

Kikuchi, Makoto: *See*—
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 4,892,393, Cl. 350-350.00S.

Kim, Hyung S.: *See*—
Rogers, Philip S.; Rawlings, Rees D.; and Kim, Hyung S., 4,892,846, Cl. 501-8.000.

Kim, Mark S.; and Berge, Gary L., to Williams Electronics Games, Inc. Two and four position target assembly. 4,892,309, Cl. 273-127.00R.

Kimball, Donald: *See*—
Kruse, Jurgen M.; and Kimball, Donald, 4,892,787, Cl. 428-331.000.

Kimberly-Clark Corporation: *See*—
Datta, Paul J.; and Anderson, Gary C., 4,892,534, Cl. 604-370.000.
Reeves, William G.; Roeder, Robert J.; and Duello, Leonard E., 4,892,784, Cl. 428-288.000.
Serbiak, Paul J.; Greenman, Edwin G.; and Shanklin, Gary L., 4,892,758, Cl. 427-242.000.
Stevens, Robert A.; Boland, Leona G.; and Chistalas, John L., 4,892,598, Cl. 156-91.000.
Strack, David C.; Baer, Samuel C.; Cates, Diana M.; and Venkatapathy, Raju, 4,891,957, Cl. 66-192.000.

Kimura, Kazuo: *See*—
Kudo, Yoshinobu; Fukushima, Akira; Kimura, Kazuo; and Date, Mitsuko, 4,892,398, Cl. 350-475.000.

Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, to Pioneer Electronic Corporation. Disk player and disk playing method in which tracking miss tolerance is adjusted. 4,893,294, Cl. 369-44.000.

Kimura, Toshiyuki: *See*—
Endo, Fumio; Kimura, Toshiyuki; and Aoyagi, Yoshio, 4,893,293, Cl. 369-34.000.

Kimura, Tsutomu: *See*—
Kogane, Mikio; Nishimura, Mizuho; and Kimura, Tsutomu, 4,892,019, Cl. 83-105.000.

Kimura, Yoshikazu: *See*—
Terashima, Shiro; Kimura, Yoshikazu; Ito, Yoshio; Sakai, Kunikazu; and Hiyama, Tamejiro, 4,892,961, Cl. 549-419.000.

King Chemical Kabushikigaisha: *See*—
Tabita, Yoshikatsu, 4,891,904, Cl. 43-112.000.

King, Patrick D., to Flo-Con Systems, Inc. Joint and shroud support for pour tube and collector nozzle. 4,892,235, Cl. 222-607.000.

Kinnell, Christine J.: *See*—
Bick, Peter A.; and Kinnell, Christine J., 4,893,291, Cl. 368-10.000.

Kinslow, William G.: *See*—
Powers, Thomas F.; and Kinslow, William G., 4,892,205, Cl. 215-1.00C.

Kionuma, Masahiro: *See*—
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, 4,893,140, Cl. 354-149.110.

Kirk, Paula S.; and Olson, Dale R., to BASF Corporation. Process for making a spray-dried, directly-compressible vitamin powder comprising unhydrolyzed gelatin. 4,892,889, Cl. 514-774.000.

Kirk, Thomas K.: *See*—
Dolphin, David H.; Nakano, Taku; Kirk, Thomas K.; Wijesekera, Tilak P.; Farrell, Roberta L.; and Maione, Theodore E., 4,892,941, Cl. 540-145.000.

Kirkland, William J.; Lukach, Carl A.; and McLachlan, William C., to Aqualon Company. Composition comprising water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose and water-soluble, nonionic hydroxyethyl cellulose. 4,892,589, Cl. 106-197.100.

Kishi, Kazuya: *See*—
Yakuwa, Masahiko; Tomozawa, Kikuo; and Kishi, Kazuya, 4,892,077, Cl. 123-487.000.

Kishi, Masamichi: *See*—
Tada, Kaoru; and Kishi, Masamichi, 4,893,195, Cl. 358-454.000.

Kishi, Noriyuki; Kubodera, Masao; and Akiyama, Eitetsu, to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English). Method of controlling supercharging pressure in internal combustion engines. 4,891,947, Cl. 60-602.000.

Kishiki, Ichirou: *See*—
Miwa, Hiromichi; Nagaishi, Hatsuo; Kishiki, Ichirou; and Koyama, Hirokimi, 4,892,072, Cl. 123-340.000.

Kitamura, Hiroki: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,893,190, Cl. 358-298.000.

Kitamura, Ikuo: *See*—
Emori, Teruaki; Mase, Hiroyuki; and Kitamura, Ikuo, 4,893,201, Cl. 360-77.040.

Kittridge, John H.; and Nellett, Suzanne. Auxiliary side view mirror module. 4,892,401, Cl. 350-626.000.

Klaiber, Rolf: *See*—
Dilk, Gerhard; Klaiber, Rolf; Kreschel, Kurt; Krieg, Wolfgang; Ruckwied, Heinz; and Ulrich, Gerhard, 4,893,218, Cl. 362-61.000.

Klainer, Stanley M.; Goswami, Kisholoy; Herron, Nelson R.; Simon, Stephen J.; and Eccles, Lawrence A., to FiberChem Inc. Reservoir fiber optic chemical sensors. 4,892,383, Cl. 350-96.290.

Klausing, Thomas A.; and Schluer, Larry, to Gas Research Institute. Engine suspension system. 4,891,955, Cl. 62-295.000.

Kleefeldt, Frank; and Menke, Hans T., to Kiekert GmbH & Co. Kommanditgesellschaft. Power-closing motor-vehicle door latch. 4,892,339, Cl. 292-201.000.

Klein, Sidi. Facial mask for use in effecting isometric toning of facial muscles. 4,892,092, Cl. 128-76.00B.

Klesse, Wolfgang; Rauch, Hubert; Arndt, Peter J.; and Suetterlin, Norbert, to Rohm, GmbH. Polymer powders of low fines content and method for making the same by spray drying. 4,892,910, Cl. 525-221.000.

Klink, Rainer: *See*—
von Benda, Klaus; Benczur-Urmossy, Gabor; Berger, Gerhard; Klink, Rainer; and Gierz, Uwe, 4,892,793, Cl. 429-60.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Stoeckmann, Helmut; Schuette, Klaus; and Schmitz, Franz-Rudolf, 4,892,257, Cl. 241-32.000.

Knapp, Alan G.; and Mansell, John R., to U.S. Philips Corporation. Color display tube with channel electron multiplier means. 4,893,053, Cl. 313-400.000.

Knapp, Walter R. Interlocking door guard. 4,891,906, Cl. 49-65.000.

Knauer, Karl; and Kamp, Winfried, to Siemens Aktiengesellschaft. Adder cell for carry-save arithmetic. 4,893,269, Cl. 364-784.000.

Knerr, Manfred, to Bayer Aktiengesellschaft. Purification of polycarbonate with extractant/swelling agent and elevated pressure and temperature. 4,892,931, Cl. 528-493.000.

Knetsch, Wilfried, to Ogussa Osterreichische Gold-und Silber Scheideanstalt Scheid und Roessler Gesellschaft M.b.H. & Co. KG. Hand tool for cleaning disinfecting and/or lubricating. 4,892,112, Cl. 134-102.000.

Knifton, John F.: *See*—
Champion, Donald H.; Knifton, John F.; and Su, Wei-Yang, 4,892,959, Cl. 548-579.000.

Knight, Alan D.: *See*—
Dranchak, David W.; Engle, David E.; and Knight, Alan D., 4,892,487, Cl. 439-260.000.

Knowles, Steven M.: *See*—
Spalink, Robert D.; Knowles, Steven M.; and Kusztowny, John T., 4,892,117, Cl. 137-614.030.

Knudsen, Michael J.: *See*—
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.

Koashi, Katsue; and Eguchi, Yosuke, to Kurashiki Boseki Kabushiki Kaisha. Apparatus for measuring the thickness of a thin film with angle detection means. 4,893,024, Cl. 250-560.000.

Kobasz, William: *See*—
Rao, Bhaskara M. L.; Kobasz, William; and Menke, James C., 4,892,797, Cl. 429-210.000.

Kobayashi, Eiichi: *See*—
Tanida, Osamu; Okuno, Yoshiharu; Yoshida, Katsuhiko; Sakamoto, Nobuyasu; Ishikawa, Hsao; and Kobayashi, Eiichi, 4,892,242, Cl. 225-2.000.

Kobayashi, Hiroo, to Mitsubishi Denki Kabushiki Kaisha. Shadow mask type color cathode ray tube. 4,893,054, Cl. 313-408.000.

Kobayashi, Masaaki: *See*—
Hara, Zenichiro; Kobayashi, Masaaki; Tatsuda, Kazunori; Terazaki, Nobuo; and Iwata, Shuji, 4,893,056, Cl. 313-495.000.

Kobayashi, Noboru: *See*—
Urushiwara, Noriyoshi; Kobayashi, Noboru; and Kobayashi, Ryoichi, 4,893,215, Cl. 361-395.000.

Kobayashi, Ryoichi: *See*—
Urushiwara, Noriyoshi; Kobayashi, Noboru; and Kobayashi, Ryoichi, 4,893,215, Cl. 361-395.000.

Kobayashi, Tadahiko; Sahashi, Masashi; and Tokai, Yoichi, to Kabushiki Kaisha Toshiba. Torque detecting apparatus. 4,891,992, Cl. 73-862.360.

Kobler, Ingo, to MAN Roland Druckmaschinen AG. Combination sheet folding and selectively operable stapling apparatus. 4,892,297, Cl. 270-38.000.

Koch, Durmus, to D-R Medical Systems, Inc. Vascular graft. 4,892,539, Cl. 623-1.000.

Koczara, Michael D.: *See*—
Newman, Howard G.; Monette, David G.; Koczara, Michael D.; Ribant, Duane J.; Papke, Ronald D.; Bien, Alfred A.; and Hawkins, Richard A., 4,892,342, Cl. 292-347.000.

Kodama, Kazumasa: *See*—
Eto, Kunihiko; Mori, Yutaka; Tanooka, Shigeo; and Kodama, Kazumasa, 4,893,239, Cl. 364-424.050.

Kodera, Masao; and Mikami, Seishin, to Nippon Soken, Inc. Planar array antenna. 4,893,129, Cl. 343-700.0MS.

Koenig & Bauer Aktiengesellschaft: *See*—
Barrois, Claus D.; and Dieterich, Philipp A., 4,892,301, Cl. 271-227.000.

Koga, Yasuhide: *See*—
Kato, Yoichiro; Takao, Hiroyuki; Koga, Yasuhide; and Takashima, Tsuguro, 4,892,293, Cl. 266-193.000.

Kogane, Mikio; Nishimura, Mizuho; and Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Sheet punching cutter. 4,892,019, Cl. 83-105.000.

Kohler Co.: *See*—
Coughlin, Jeffrey P., 4,892,068, Cl. 123-182.000.

Kohmura, Isao; and Iwaosa, Katsuaki, to Mitsubishi Paper Mills, Ltd. Silver halide photosensitive materials. 4,892,812, Cl. 430-567.000.

Kohno, Junichi: *See*—
Tsuchiya, Masaru; Kohno, Junichi; and Okauchi, Ken, 4,892,994, Cl. 219-216.000.

Koike, Mikio: *See*—
Karuga, Noboru; Hara, Kazumasa; Koike, Mikio; and Nishijima, Mitsuru, 4,892,048, Cl. 112-254.000.

Koito Manufacturing Co., Ltd.: *See*—
Kakidaira, Susumu, 4,893,220, Cl. 362-80.100.

Kojima, Katsumi, to Nippon Air Brake Co., Ltd. Compressed air pressure supply system. 4,892,569, Cl. 55-163.000.

Kojima, Takeshi: *See*—
Takeuchi, Noboru; Goto, Masakazu; Takahashi, Hiroaki; and Kojima, Takeshi, 4,892,387, Cl. 350-319.000.

Kokubun, Yoshihiro: *See*—
Hatakoshi, Genichi; Itaya, Kazuhiko; Naritsuka, Shigeya; Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Watanabe, Yukio; Ohba, Yasuo; Kokubun, Yoshihiro; and Uematsu, Yutaka, 4,893,313, Cl. 372-46.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Minamisono, Kenichi; Yasunaga, Masayuki; Watanbe, Fumio; and Baba, Noboru, 4,893,350, Cl. 455-278.000.

Kolesar, Edward S., Jr., to United States of America, Air Force. Halogen detection with solid state sensor. 4,893,108, Cl. 338-34.000.

Koleske, Joseph V., to Union Carbide Chemical and Plastics Company Inc. Photocopolymerizable compositions based on epoxy and hydroxyl-containing organic materials. 4,892,894, Cl. 522-31.000.

Kollanyi, Miklos J., to AG Communications Systems Corporation. Loss of optical input circuit. 4,893,002, Cl. 250-214.00R.

Kolossow, Klaus-Dieter, to Hermann Berstorff Maschinenbau GmbH. Extrusion method and apparatus for producing a foamable mixture of plastics material. 4,892,691, Cl. 264-54.000.

Komai, Kensaku: *See*—
Ohnishi, Souichi; Nakamura, Yasuhi[illegible]; Komai, Kensaku; and Goto, Kazuyuki, 4,893,236, Cl. 364-405.000.

Komatsu, Eri: *See*—
Sakurai, Takao; Yokota, Tadahiko; Komatsu, Eri; Mikami, Naoko; Higuchi, Ryoichi; and Takeuchi, Koji, 4,892,676, Cl. 252-299.610.

Kon, Shiji: *See*—
Murakami, Takatoshi; Kida, Toshio; Kon, Shiji; Asai, Toshinobu; and Nunome, Yoshiyuki, 4,892,696, Cl. 264-219.000.

Kondo, Makoto: *See*—
Fukushima, Nobuo; and Kondo, Makoto, 4,893,185, Cl. 358-213.170.

Kondo, Ryoji, to Nippondenso Co., Ltd. Spark plug and the method of manufacturing the same. 4,893,051, Cl. 313-141.000.

Kondo, Takeo: *See*—
Suzuki, Youichi; Segawa, Makoto; Ariizumi, Shoji; Kondo, Takeo; and Masuoka, Fujio, 4,893,159, Cl. 357-23.130.

Kond›, Toshiyuki: *See*—
Turner, Alan B.; Kondo, Toshiyuki; and Mori, Katsuhiro, 4,893,040, Cl. 310-156.000.

Konica Corporation: *See*—
Tsuchiya, Masaru; Kohno, Junichi; and Okauchi, Ken, 4,892,994, Cl. 219-216.000.

Konig, Helmut. Baking oven. 4,892,083, Cl. 126-21.00R.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hirabayashi, Shigeto; Sato, Hirokazu; and Sakamoto, Eiichi, 4,892,807, Cl. 430-505.000.

Konrad, Eugen: *See*—
Kawa, Rolf; Tesmann, Holger; Wilhelm, Josef; Rose, Karl-Heinz; and Konrad, Eugen, 4,892,728, Cl. 424-70.000.

Koparkar, Arun D.: *See*—
Shah, Shailesh B.; and Koparkar, Arun D., 4,892,739, Cl. 424-473.000.

Koppers Industries, Inc.: *See*—
Owen, S. Hudson, 4,892,249, Cl. 238-8.000.

Kopunek, Thomas V.; and Bennett, Douglas D., to Dentsply Research & Development Corp. Dental composite carrier and composite package. 4,892,481, Cl. 433-90.000.

Korber AG: *See*—
Bantien, Jurgen; Bardenhagen, Dietrich; and Staudte, Erich, 4,892,453, Cl. 414-403.000.

Korematsu, Jirou: *See*—
Tokuda, Takeshi; Korematsu, Jirou; and Tomisawa, Osamu, 4,893,170, Cl. 357-71.000.

Kornblit, Avinoam, to American Telephone and Telegraph Company AT&T Bell Laboratories. Pattern transfer process utilizing multilevel resist structure for fabricating integrated-circuit devices. 4,892,635, Cl. 204-192.360.

Koshino, Susumu: *See*—
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, 4,893,140, Cl. 354-149.110.

Koshiyouji, Takashi; and Ishida, Tsuyoshi, to Kabushiki Kaisha Toshiba. Image reading apparatus. 4,893,196, Cl. 358-474.000.

Koszi, Louis A.: *See*—
Ackerman, David A.; and Koszi, Louis A., 4,892,374, Cl. 350-96.150.

Kotz, Rainer T.; and Harder, Hans E., to Howmedica GmbH. Adjustable prosthesis for a joint bone. 4,892,546, Cl. 623-18.000.

Kovacs, Lloyd: *See*—
James, Robert C.; Kovacs, Lloyd; and Lind, Matthew R., 4,891,928, Cl. 53-250.000.

Koyama, Hirokimi: *See*—
Miwa, Hiromichi; Nagaishi, Hatsuo; Kishiki, Ichirou; and Koyama, Hirokimi, 4,892,072, Cl. 123-340.000.

Koyama, Ikuo: *See*—
Takasima, Yasuji; Koyama, Ikuo; Shimano, Kimihide; and Mazuru, Kaoru, 4,892,740, Cl. 424-474.000.

Koyama, Katsuhide: *See*—
Utsumi, Isao; Kawai, Yasuhiro; Tamura, Kaoru; Maehara, Yasunori; Fujiwara, Sigeme; and Koyama, Katsuhide, 4,892,199, Cl. 211-51.000.

Koyama, Kazuaki: *See*—
Kawai, Yoshihiko; Koyama, Kazuaki; and Yasuda, Isao, 4,891,878, Cl. 29-603.000.

Koyanagi, Masaru: *See*—
Matsuo, Ryosuke; and Koyanagi, Masaru, 4,893,029, Cl. 307-296.400.

Koza, Coleman L.; and Koza, Lawrence J. Louver gasket. 4,892,322, Cl. 277-207.00R.

Koza, Lawrence J.: *See*—
Koza, Coleman L.; and Koza, Lawrence J., 4,892,322, Cl. 277-207.00R.

Kozaki, Tetsuji; Shimamoto, Mamoru; and Oonuma, Toshio, to Nippondenso Co., Ltd.; and Kariya and Toyota Jidosha Kabushiki Kaisha. Stabilizer control apparatus for use in motor vehicles. 4,892,329, Cl. 280-772.000.

Kozyrski, Vincent T.; and Peters, Alan R., to Fletcher-Terry Company, The. Workpiece support system for cutting machine. 4,892,020, Cl. 83-463.000.

Kraft, Horst: *See*—
Langert, H. E.; and Kraft, Horst, 4,892,316, Cl. 273-167.00E.

Kraft, Simon. Concrete finishing float with rear fitting bar. 4,892,437, Cl. 404-97.000.

Kralovic, Raymond C.; and Schneider, Edward T., to Steris Corporation. Automated liquid sterilization system. 4,892,706, Cl. 422-28.000.

Kramer, Anatoly I., to R. J. Reynolds Tobacco Company. Process and apparatus for measurement of volatile residuals. 4,891,966, Cl. 73-19.000.

Kraska, Ursula A.: *See*—
Bauer, Richard D.; Kraska, Ursula A.; and Sondergeld, Manfred A., 4,892,802, Cl. 430-270.000.

Krawczyk, Steven H.: *See*—
Townsend, Leroy B.; Drach, John C.; and Krawczyk, Steven H., 4,892,865, Cl. 514-43.000.

Kreider, John R.: *See*—
Slavin, Daniel J.; and Kreider, John R., 4,892,195, Cl. 206-473.000.

Kreisner, Samuel: *See*—
Donida, Carlos O.; Degrandi, Isolde H.; De Moraes, Raul; Magdalena, Nelson; and Kreisner, Samuel, 4,892,746, Cl. 426-598.000.

Kreschel, Kurt: *See*—
Dilk, Gerhard; Klaiber, Rolf; Kreschel, Kurt; Krieg, Wolfgang; Ruckwied, Heinz; and Ulrich, Gerhard, 4,893,218, Cl. 362-61.000.

Krieg, Wolfgang: *See*—
Dilk, Gerhard; Klaiber, Rolf; Kreschel, Kurt; Krieg, Wolfgang; Ruckwied, Heinz; and Ulrich, Gerhard, 4,893,218, Cl. 362-61.000.

Kristiansen, Odd; and Drabek, Jozef, to Ciba-Geigy Corporation. Pesticidal pyridylthiadiazoles. 4,892,880, Cl. 514-342.000.

Kronenberg, Stanley, to United States of America, Army. Dose and dose rate sensor for the pocket radiac. 4,893,017, Cl. 250-370.070.

Krug, William: *See*—
Fischer, Wolfgang; Hattich, Thomas; Krug, William; and Schuster, Gerhard, 4,892,585, Cl. 106-38.220.

Kruger, Martin; Westermann, Jurgen; Arndt, Friedrich; Rees, Richard; and Hunt, Russel G., to Schering Aktiengesellschaft. 6,7-dihydropyrazolo (1,5-A)(1,3,5)triazine-2-sulphonamides, processes for their preparation and their use as herbicides and plant growth regulators. 4,892,576, Cl. 71-93.000.

Kruger, Volker. Friction bearing for deep well drilling tools. 4,892,420, Cl. 384-420.000.

Krulich, Ronald F. Window pocket insertion device and method of use therefor. 4,892,333, Cl. 281-15.100.

Kruse, Jurgen M.; and Kimball, Donald, to AM International, Inc. Coated paper for ink jet printing. 4,892,787, Cl. 428-331.000.

Krusos, Denis A.: *See*—
DiSanto, Frank J.; and Krusos, Denis A., 4,892,607, Cl. 156-275.700.

Kubierschky, Klaus; and Aronson, Herbert L., to American Science and Engineering, Inc. Dual mode radiographic measurement method and device. 4,893,015, Cl. 250-369.000.

Kubodera, Masao: *See*—
Kishi, Noriyuki; Kubodera, Masao; and Akiyama, Eitetsu, 4,891,947, Cl. 60-602.000.

Kubota, Mineo; and Masuyama, Kenji, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Portable image scanner. 4,893,189, Cl. 358-471.000.

Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., to American National Can Company. Methods for injection molding and injection blow molding multi-layer articles. 4,892,699, Cl. 264-328.800.

Kudo, Keisuke: *See*—
Fukutomi, Yoji; Fukuzawa, Takeshi; and Kudo, Keisuke, 4,892,078, Cl. 123-489.000.

Kudo, Satoshi, to Hitachi, Ltd. Method for manufacturing semiconductor integrated circuit device. 4,892,837, Cl. 437-31.000.

Kudo, Takeshi: *See*—
Suzuki, Migaku; Ochi, Mitsuzo; and Kudo, Takeshi, 4,892,528, Cl. 604-385.200.

Kudo, Yoshinobu; Fukushima, Akira; Kimura, Kazuo; and Date, Mitsuko, to Minolta Camera Kabushiki Kaisha. Triplet type objective with a diaphragm arranged behind the lens system. 4,892,398, Cl. 350-475.000.

Kudoh, Shoji: *See*—
Suzuki, Tsuyoshi; and Kudoh, Shoji, 4,892,522, Cl. 604-192.000.

Kuehn, Stephen F.: *See*—
Bundy, Charles H.; Graham, Robert A.; Kuehn, Stephen F.; Precit, Richard R.; and Rogers, Michael S., 4,893,049, Cl. 310-338.000.

Kuehnke, Hermann: *See*—
Eitner, Dorothea; Kuehnke, Hermann; Messingschlager, Elisabeth; and Wilke, Dorothea, 4,893,321, Cl. 378-121.000.

Kuhnert, Dieter. Technique and spark plug to ignite very lean fuel air mixtures, particulary for gas engines. 4,892,070, Cl. 123-274.000.

Kuijk, Karel E., to U.S. Philips Corporation. Method of driving a display device and a display device suitable for such a method. 4,892,389, Cl. 350-333.000.

Kulkarni, Amol A., to Viking Systems International, Inc. Process for beneficiation of coal and associated apparatus. 4,892,648, Cl. 209-164.000.

Kumar, Ravi: *See*—
Schmidt, William P.; Kumar, Ravi; and Abel, Alan D., 4,892,565, Cl. 55-26.000.

Kumazawa, Kiyoshi, to Apollo Corporation. Action toy vehicle with controllable auxiliary wheel. 4,892,503, Cl. 446-456.000.

Kume, Hidehiro: *See*—
Matsumoto, Yoshiyuki; Kume, Hidehiro; Mitsumori, Koji; Yoshitoshi, You; Yamamoto, Etsufumi; and Oinoue, Hiroshi, 4,893,296, Cl. 369-112.000.

Kunimune Kogyosho Co., Ltd.: *See*—
Kunimune, Noriaki; and Wada, Yukio, 4,892,189, Cl. 206-232.000.

Kunimune, Noriaki; and Wada, Yukio, to Kunimune Kogyosho Co., Ltd. Case for multiple compact disks. 4,892,189, Cl. 206-232.000.

Kunze, Dieter; and Lancier, Peter, to Siemens Aktiengesellschaft. Cable plow. 4,892,443, Cl. 405-164.000.

Kupersmit, Julius B. Container cargo net. 4,892,210, Cl. 220-1.500.

Kurashiki Boseki Kabushiki Kaisha: *See*—
Koashi, Katsue; and Eguchi, Yosuke, 4,893,024, Cl. 250-560.000.

Kure-Jensen, Jens; and Shafer, Harris S., to General Electric Company. Steam turbine-generator thermal performance monitor. 4,891,948, Cl. 60-645.000.

Kure-Jensen, Jens: *See*—
Davis, Donald H.; Kure-Jensen, Jens; and Jenkins, Solomon, III, 4,892,118, Cl. 137-625.300.

Kureha Chemical Industry Co., Ltd.: *See*—
Hori, Saburo, 4,892,850, Cl. 501-127.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Hisazumi, Nobuyuki; Kahara, Keisuke; and Matsukura, Yoshihiro, 4,892,765, Cl. 428-34.800.

Kurihara, Noriko: *See*—
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.

Kuriyagawa, Kazuya: *See*—
Ito, Meiichi; Kuriyagawa, Kazuya; Adachi, Hitoshi; and Ohno, Kohei, 4,892,104, Cl. 128-697.000.
Kuroda, Katsuhiro, to Hitachi, Ltd. Scanning electron microscope and the like apparatus. 4,893,009, Cl. 250-310.000.
Kurosawa, Isamu: *See*—
Sakurada, Muneo; Kurosawa, Isamu; and Wakabayashi, Shinji, 4,892,135, Cl. 165-42.000.
Kurtz, Helen L.: *See*—
Renk, Richard J.; Boller, George E.; and Ebert, Richard M., 4,892,000, Cl. 74-467.000.
Kurtzman, Zvi; Stuart, Keith O.; and Bartosh, Blake W., to Aura Systems, Inc. Electromagnetic strut assembly. 4,892,328, Cl. 280-707.000.
Kushibiki, Nobuo; and Yoshinaga, Yoko, to Canon Kabushiki Kaisha. Variable-focus optical device. 4,892,396, Cl. 350-423.000.
Kustra, Thomas A.; and Caffarel, Alfred J., to United States of America, Energy. Method and apparatus for correcting eddy current signal voltage for temperature effects. 4,893,079, Cl. 324-225.000.
Kusztowny, John T.: *See*—
Spalink, Robert D.; Knowles, Steven M.; and Kusztowny, John T., 4,892,117, Cl. 137-614.030.
Kwiek, Adam, to Durable Packaging Corporation. Carton erector apparatus. 4,892,513, Cl. 493-316.000.
Kwong, Peter C.: *See*—
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 4,892,604, Cl. 156-244.240.
Kymmene Oy: *See*—
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.
Kyocera Corporation: *See*—
Yoshida, Makoto; and Yokoyama, Kiyoshi, 4,892,848, Cl. 264-65.000.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Yoshida, Hajime; Hanai, Nobuo; and Shitara, Kenya, 4,892,935, Cl. 530-387.000.
Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Yoshida, Hajime; and Hanai, Nobuo, 4,892,934, Cl. 530-387.000.
L. R. Nelson Corporation: *See*—
Bruninga, Kenneth J., 4,892,252, Cl. 239-205.000.
La Telemecanique Electrique: *See*—
Leonard, Didier; Periot, Jean M.; and Petit, Pierre, 4,893,076, Cl. 324-207.000.
Labaton, Isaac J., to Luz Industries Israel, Ltd. Device and method for removing gaseous impurities from a sealed vacuum. 4,892,142, Cl. 165-134.100.
Labrie, Craig B., to Davidson Textron Inc. Interior trim foam product and method of fabrication thereof. 4,892,770, Cl. 428-71.000.
Lady, James M.: *See*—
Rogers, John N.; Lady, James M.; Bilsbarrow, Donald W.; and Trujillo, Rene S., 4,893,242, Cl. 364-426.010.
Lafferty, William G.; and Howard, Robert E., to Polymedical Technologies, Inc. Fully portable medical I.V. equipment stand/pole. 4,892,279, Cl. 248-125.000.
LaHaye, Paul G.; and Norster, Eric R., to H.P.S. Merrimack Corp. Means and method for preventing unwanted accumulation in heat exchangers. 4,892,139, Cl. 165-95.000.
Lahey, Michael D.: *See*—
Henderson, David L.; Herbert, Brian K.; Lahey, Michael D.; and Robbins, Jamey L., 4,893,116, Cl. 340-747.000.
Lai, Kuo-Yann: *See*—
Dixit, Nagaraj S.; Rhinesmith, Robert J.; Sullivan, James J.; Barone, Cynthia A.; Adams, Richard P.; and Lai, Kuo-Yann, 4,892,673, Cl. 252-114.000.
Laico, Joseph P.; and Molino, Joseph L., to Lincoln Mills, Inc. Protective cover for hypodermic needle. 4,892,521, Cl. 604-192.000.
Lamanna, William M.; Wright, Robin E.; and Chou, Hsin-Hsin, to Minnesota Mining and Manufacturing Company. Electrophoretic imaging metal-toner fluid dispersion. 4,892,798, Cl. 430-38.000.
Lamirault, Sylvie: *See*—
Germanaz, Patrick; Lamirault, Sylvie; and Picard, Gerard, 4,892,630, Cl. 204-59.500.
Lampe, Warren R.; and Traver, Frank J., to General Electric Company. Fast room temperature vulcanizing silicone elastomers. 4,892,907, Cl. 524-731.000.
Lamplight Farms, Inc.: *See*—
Tendick, Donald W., Sr., 4,892,711, Cl. 422-125.000.
Lamy, Bernard: *See*—
Bichon, Daniel; Lamy, Bernard; and Borloz, William, 4,892,733, Cl. 424-422.000.
Lancier, Peter: *See*—
Kunze, Dieter; and Lancier, Peter, 4,892,443, Cl. 405-164.000.
Landen, Peter; Paulini, Dieter; and Wagner, Wolfram, to Bayer Aktiengesellschaft. Device for crimping large filament groups. 4,891,873, Cl. 28-255.000.
Landstingens Inkopscentral, Lic, Ekonomisk Forening: *See*—
Bjornberg, Sten; and Ahlstrand, Ove, 4,892,535, Cl. 604-380.000.
Lang, Gerard: *See*—
Maignan, Jean; Lang, Gerard; Malle, Gerard; Restle, Serge; and Shroot, Braham, 4,892,940, Cl. 536-55.200.
Shroot, Braham; Lang, Gerard; and Maignan, Jean, 4,892,864, Cl. 514-510.000.
Lang, Robert W., to Ciba-Geigy Corporation. Process for the preparation of 2,2-difluoropent-4-enoic acids and acid derivatives. 4,892,962, Cl. 556-416.000.
Lang, Sigrid: *See*—
Wald, Hanns J.; Getrost, Wilfried; and Lang, Sigrid, 4,892,777, Cl. 428-212.000.
Lange, Klaus-Ulrich, to Man Roland Druckmaschinen AG. Combination collection and folding cylinder system. 4,892,036, Cl. 101-240.000.
Langert Golf Co., Inc.: *See*—
Langert, H. E.; and Kraft, Horst, 4,892,316, Cl. 273-167.00E.
Langert, H. E.; and Kraft, Horst, to Langert Golf Co., Inc. Golf club head. 4,892,316, Cl. 273-167.00E.
Lankford, James, Jr., to Southwest Research Institute. Ceramic composition having low friction coefficient at high operating temperatures. 4,892,849, Cl. 501-97.000.
Lanxide Technology Company, LP: *See*—
Newkirk, Marc S., 4,892,786, Cl. 428-307.300.
Lanzarini, Ernesto; and Boero, Bruno, to Valeo. Friction clutch with two friction discs, and a clutch assembly including such a clutch. 4,892,177, Cl. 192-106.200.
Larrick, Benjamin F.: *See*—
Glen, Daniel R.; Mansour, Azzam N.; O'Neill, Kathleen M.; Dalek, Steven; and Larrick, Benjamin F., 4,892,629, Cl. 204-56.100.
Lassiter, Jimmie F., Jr.; and Slager, David R., to Meyer Machine Company. Bucket distribution system. 4,892,179, Cl. 198-365.000.
Lastuck, Lennard V.: *See*—
Estkowski, Michael H.; Minor, Don E.; and Lastuck, Lennard V., 4,892,354, Cl. 297-301.000.
Latge, Christian, to Commissariat A L'Energie Atomique. Cold trap for the purification of liquid metals containing dissolved impurities. 4,892,653, Cl. 210-184.000.
Latreille, Maurice G.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,892,699, Cl. 264-328.800.
Lau, Po Chun. Versatile network of multiple spout balloons. 4,892,500, Cl. 446-221.000.
Lauer, Wilhelm: *See*—
Schweikert, Wilhelm; and Lauer, Wilhelm, 4,893,217, Cl. 361-506.000.
Laurin, Dean G.: *See*—
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 4,892,604, Cl. 156-244.240.
Laverty, Martin J., Jr., to Coyne & Delany Co. Disabler and activation system for plumbing fixture. 4,891,864, Cl. 91-399.000.
Law, Kam S.: *See*—
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,892,753, Cl. 427-38.000.
Lawrence, Peter D.: *See*—
Chan, STephen K. C.; and Lawrence, Peter D., 4,893,254, Cl. 364-513.000.
Lawther, Joel S.: *See*—
Alligood, John H.; and Lawther, Joel S., 4,893,139, Cl. 354-149.100.
Leatherman, Dennis D.; and Schwarz, Richard A., to PPG Industries, Inc. Multilayer article of microporous and substantially nonporous materials. 4,892,779, Cl. 428-220.000.
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Antonio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, to Siemens AG. Digital interface between at least two subscriber line interface circuits and a processing unit. 4,893,309, Cl. 370-110.100.
Leclaire, Remy: *See*—
Pottier, Daniel; Leclaire, Remy; and Vulliez, Paul, 4,892,010, Cl. 74-595.000.
LeCren, Richard T.: *See*—
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Lectrolarm Custom Systems, Inc.: *See*—
Smith, William V., 4,893,202, Cl. 360-79.000.
Lee, Chang-Kuei: *See*—
Choi, Byung; C.; Karsner, Grant G.; Lee, Chang-Kuei; Malladi, Madhava; and Milstein, Donald, 4,892,644, Cl. 208-107.000.
Lee, David A.: *See*—
Taylor, Douglas P.; and Lee, David A., 4,892,051, Cl. 114-1.000.
Lee, John: *See*—
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Lee, Kiu H.: *See*—
Cann, Kevin J.; Karol, Frederick J.; Lee, Kiu H.; and Marcinkowsky, Arthur E., 4,892,853, Cl. 502-112.000.
Lee, Sang H.: *See*—
Chao, Hung-Hsiang J.; Lee, Sang H.; and Wu, Liang T., 4,893,306, Cl. 370-94.200.
Lee, Sukhan. Distributed proximity sensor system having embedded light emitters and detectors. 4,893,025, Cl. 250-561.000.
Lee, Sung J., to Biofor, Ltd. Oxaza heterocycles and pharmaceutical compositions containing same. 4,892,870, Cl. 514-211.000.
Lee, Yun-Parn T. Means and method for implementing a two-dimensional truth-table look-up holgraphic processor. 4,892,370, Cl. 350-3.740.
Le Gougnec, Robert: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Anto-

nio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, 4,893,309, Cl. 370-110.100.
Lehberger, Arthur N. Balancing stick toy. 4,892,307, Cl. 273-1.0GF.
Lehtonen, Markku S.: *See*—
Kairi, Matti O.; and Lehtonen, Markku S., 4,891,927, Cl. 52-642.000.
Leibowitz, Paul J.; and Ryan, Michael J., to Schering Corporation. Novel hybrid interferon species. 4,892,743, Cl. 424-85.700.
Leigh, Arthur G.; and Oakes, John, to Lever Brothers Company. Method for conditioning fabrics. 4,892,555, Cl. 8-101.000.
Leighton, John C.; and Sanders, Michael J., to National Starch and Chemical Corporation. Water soluble polymers containing allyloxybenzenesulfonate monomers. 4,892,898, Cl. 524-3.000.
Leitheiser, Robert H.; and Karloske, Joan E., to Freeman Chemical Corporation. Terephthalic containing hybrid castable resins. 4,892,919, Cl. 528-48.000.
Le-Khac, Bi, to Arco Chemical Technology, Inc. Ultrahigh water-absorbing fiber-forming composition. 4,892,533, Cl. 604-368.000.
Leng, Barry S.: *See*—
Carmen, Raleigh A.; Leng, Barry S.; Lewis, Willie J.; and Nelson, Edward J., 4,892,537, Cl. 604-408.000.
Leona Electronics Co., Ltd.: *See*—
Wai-Kwan, Ho, 4,892,999, Cl. 235-1.00D.
Leonard, Didier; Periot, Jean M.; and Petit, Pierre, to La Telemecanique Electrique. Proximity detector using inductive effect on oscillating circuit the charge of which is controlled by a pulse of short duration. 4,893,076, Cl. 324-207.000.
Leonard, Didier: *See*—
Lewiner, Jacques; Hennion, Claude; and Leonard, Didier, 4,893,118, Cl. 340-825.540.
Leonard, Robert J., to Endocon, Inc. Dispensing paste for forming medicinal pellets. 4,892,734, Cl. 424-422.000.
Leonowicz, Michael E.; Vaughan, David E. W.; and Strohmaier, Karl G., to Exxon Research and Engineering Company. Crystalline zeolite materials constituting maz-morite intermediates. 4,892,721, Cl. 423-328.000.
Lepert, Andre; Evans, Morris L.; and Jacob, Lutz E., to Exxon Research & Engineering Company. Adhesive emulsion. 4,892,905, Cl. 524-499.000.
Lerstol, Arne M. Device in a building structure. 4,891,917, Cl. 52-1.000.
Les Emballages P. Proulx Ltee/P. Proulx Packaging Ltd.: *See*—
Proulx, Denis, 4,892,458, Cl. 414-791.600.
Le Saige de la Villesbrunne, Arnaud G.: *See*—
Brown de Colstoun, Francois; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; and Moscovici, Jean-Claude M., 4,893,026, Cl. 250-574.000.
Lesh, Geoffrey C.: *See*—
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Lester, Robert A.: *See*—
Masson, Jean P. H. R. M.; Gollwitzer, Lee H.; and Lester, Robert A., 4,893,285, Cl. 367-35.000.
Letcher, John H., III. Noise suppression in magnetic resonance imaging. 4,893,082, Cl. 324-312.000.
Leung, Cissy: *See*—
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,892,753, Cl. 427-38.000.
Leunig, Jack C.: *See*—
Ritzer, Alan; Moloney, George P., Jr.; and Leunig, Jack C., 4,892,694, Cl. 264-109.000.
Leupold, Herbert A., to United States of America, Army. Superconducting PYX structures. 4,893,103, Cl. 335-216.000.
Levandoski, Ronald R. Face bow. 4,892,480, Cl. 433-73.000.
Lever Brothers Company: *See*—
Leigh, Arthur G.; and Oakes, John, 4,892,555, Cl. 8-101.000.
Levine, Irving E. Methyl ether fuels for internal combustion engines. 4,892,561, Cl. 44-51.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural sulfonamides. 4,892,946, Cl. 544-321.000.
Lew, Hyok S. Snow chain having a network of diamond shaped openings. 4,892,127, Cl. 152-221.000.
Lew, Hyok S. Solar trap. 4,892,593, Cl. 136-246.000.
Lewiner, Jacques; Hennion, Claude; and Leonard, Didier, to Societe Fontaine. Device for identification by proximity. 4,893,118, Cl. 340-825.540.
Lewis, Willie J.: *See*—
Carmen, Raleigh A.; Leng, Barry S.; Lewis, Willie J.; and Nelson, Edward J., 4,892,537, Cl. 604-408.000.
Lewmar Marine Limited: *See*—
Shuker, Brian; and Huggett, Richard D. J., 4,892,291, Cl. 254-342.000.
Leybold-Aktiengesellschaft: *See*—
Mahler, Peter, 4,892,451, Cl. 414-217.000.
Liang, Marc D.: *See*—
Narayanan, Krishna; and Liang, Marc D., 4,892,096, Cl. 606-1.000.
Liang, Yeon F., to Phillips Petroleum Company. Method for lowering the melt crystallization temperature of an arylene sulfide polymer with organic phosphite composition. 4,892,930, Cl. 528-487.000.
Liddle, Franklin D.; and Tassielli, Ottavio A. System for segregating trash. 4,892,647, Cl. 209-11.000.
Lidinsky, William P.: *See*—
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.
Lien, Charles: *See*—
Gallios, George C.; Lien, Charles; Stella, Remo; and Boucher, Wendell, 4,893,227, Cl. 363-26.000.
LifeLines technology, Inc.: *See*—
Preziosi, Anthony F.; Prusik, Thaddeus; and Baughman, Ray H., 4,892,677, Cl. 252-408.100.
Liljestrom, William P.: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,892,261, Cl. 241-301.000.
Lillie, Ross J.: *See*—
Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., 4,893,316, Cl. 375-44.000.
Lillis, William J.; and Wang, Anthony D., to Burr-Brown Corporation. Complementary current mirror for correcting input offset voltage of diamond follower, especially as input stage for wide-band amplifier. 4,893,091, Cl. 330-253.000.
Lilly Industries Limited: *See*—
Gallagher, Peter T.; Hicks, Terence A.; and Mullier, Graham W., 4,892,963, Cl. 558-414.000.
Jones, Brian E., 4,892,766, Cl. 428-36.400.
Lin, Jiang-Jen, to Texaco Inc. Process for synthesis of amidoacids using a cobalt catalyst and a bidental phosphine ligand. 4,892,687, Cl. 260-404.000.
Lin, Steven T. C.: *See*—
Ainsworth, Robert D.; Devanathan, Thirumalai N. C.; and Lin, Steven T. C., 4,892,552, Cl. 623-23.000.
Lin, Weng-Pin. Trigger control means for moveable toys. 4,891,995, Cl. 74-3.520.
Lincoln Mills, Inc.: *See*—
Laico, Joseph P.; and Molino, Joseph L., 4,892,521, Cl. 604-192.000.
Lind, Matthew R.: *See*—
James, Robert C.; Kovacs, Lloyd; and Lind, Matthew R., 4,891,928, Cl. 53-250.000.
Linder, Donald L.: *See*—
Eastmond, Bruce C.; and Linder, Donald L., 4,893,347, Cl. 455-52.000.
Lingnau, Juergen: *See*—
Wingen, Rainer; Guenther, Dieter; and Lingnau, Juergen, 4,892,799, Cl. 430-77.000.
Linssen, Henricus M. H., to U.S. Philips Corporation. Switching arrangement. 4,893,061, Cl. 315-227.00R.
Lippa, Roberto, to Bridgestone/Firestone, Inc. Automatic transverse splicing device for uncured elastomeric sheet material. 4,892,608, Cl. 156-421.000.
Lisak, Stephen P., to Ryder International Corporation. Headlamp adjusting mechanism. 4,893,219, Cl. 362-66.000.
Liska, Miroslav; and Tomsicek, Anthony, to Durotech Co. Quick connect-disconnect drive shaft coupling. 4,892,430, Cl. 403-24.000.
List, Hans, to AVL Gesellschaft Fur Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof. Dr.Dr.H.C. Hans List. Method concerning the delivery of fuel into the combustion chamber of a diesel engine and a device for realizing the method. 4,892,065, Cl. 123-26.000.
Little, Graeme M., to Ampex Corporation. Method and apparatus for performing high speed video animation. 4,893,198, Cl. 360-14.100.
Little, Wendell L.: *See*—
Davis, Walter L.; Herold, Barry W.; and Little, Wendell L., 4,893,271, Cl. 364-900.000.
Littlewood, Morgan: *See*—
Giacopelli, James N.; and Littlewood, Morgan, 4,893,304, Cl. 370-60.000.
Litton Systems, Inc.: *See*—
Stewart, Robert E., 4,891,983, Cl. 73-517.00B.
Littrell, Melvin M. Water precipitator apparatus. 4,892,570, Cl. 55-269.000.
Liu, Nan-I, to General Electric Company. Polyetherimide ester elastomer. 4,892,901, Cl. 524-303.000.
Lloyd, Kenneth O.: *See*—
Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shunichiro; and Lloyd, Kenneth O., 4,892,828, Cl. 435-240.270.
Lococo, Michael P. Dental retraction cord. 4,892,482, Cl. 433-136.000.
Loctite Corporation: *See*—
Drain, Kieran F.; Nativi, Larry A.; and Thompson, Richard T., 4,892,764, Cl. 428-34.500.
Lodder, Robert A., to Indiana University Foundation. Method for analyzing intact capsules and tablets by near-infrared reflectance spectrometry. 4,893,253, Cl. 364-497.000.
Loeffler, Vaughn R.: *See*—
Dilling, Peter; Loeffler, Vaughn R.; Prazak, Gerald; and Thomas, Karin U., 4,892,588, Cl. 106-123.100.
Lofgren, Karl M. J.: *See*—
Shearer, Gerald W.; Lofgren, Karl M. J.; and Ouyang, Kenneth W., 4,893,030, Cl. 307-296.800.
Loftsson, Thorsteinn: *See*—
Bodor, Nicholas S.; and Loftsson, Thorsteinn, 4,892,737, Cl. 424-449.000.
Lohre, Gunther. Sport fencing device. 4,892,303, Cl. 272-98.000.
London, Joe F., Jr.: *See*—
Conklin, Delano M.; and London, Joe F., Jr., 4,892,557, Cl. 8-497.000.
Long, Michael; Palone, Thomas W.; and Kemp, Paul, to Eastman Kodak Company. Air-bearing center-guiding apparatus and method. 4,892,243, Cl. 226-97.000.

Longley, Lester A.: *See*—
Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., 4,893,316, Cl. 375-44.000.

Lopez, Clisthenes F., Jr. Bassinet rocker. 4,891,852, Cl. 5-105.000.

Lopez, Jesus C.: *See*—
Dominguez, Ruben, Jr.; Finlay, David E.; Hanna, Stephen D.; Lopez, Jesus C.; Stevenson, David C.; and Zegafuse, Donald W., Jr., deceased, 4,893,257, Cl. 364-519.000.

Lord Corporation: *See*—
Warren, Patrick A.; Auerbach, Robert A.; and Polaski, Eugene L., 4,892,756, Cl. 427-206.000.

L'Oreal: *See*—
Maignan, Jean; Lang, Gerard; Malle, Gerard; Restle, Serge; and Shroot, Braham, 4,892,940, Cl. 536-55.200.

Lov-Cot Industries, Incorporated: *See*—
Wiley, Jack A., 4,891,918, Cl. 52-3.000.

Lowry, James D., Jr.: *See*—
Nowicki, Neal R.; and Lowry, James D., Jr., 4,892,970, Cl. 22-413.000.

Loy, Jerald M.: *See*—
Dunaway, Thomas J.; Speilberger, Richard K.; Loy, Jerald M.; Dicks, Lori A.; and Balgaard, Luverne O., 4,892,245, Cl. 228-180.200.

Lubarsky, Daniel P.; Weigt, George A.; and Haisch, Mark E., to Pacific Bell. Multijunction unit apparatus for use in a digital network. 4,893,340, Cl. 380-50.000.

Lubbers, Willi, to Nico-Pyrotechnik Hanns-Jurgen Diederichs GmbH & Co. KG. Cartridged ammunition. 4,892,038, Cl. 102-439.000.

Lucas Industries Public Limited Co.: *See*—
Harrison, Anthony W., 4,892,173, Cl. 188-73.440.

Luchtenberg, Helmut: *See*—
Ohm, Andreas; Luchtenberg, Helmut; Maegata, Shinji; and Opitz, Wolfgang, 4,892,741, Cl. 424-479.000.

Luciano, Lawrence W.: *See*—
Luciano, Robert A.; Luciano, Lawrence W.; Rowe, Don H.; and Hanson, Violet M., 4,892,511, Cl. 493-194.000.

Luciano, Robert A.; Luciano, Lawrence W.; Rowe, Don H.; and Hanson, Violet M., to Hanson, Violet M. Method and apparatus for the automatic manufacture of flat bottom bags. 4,892,511, Cl. 493-194.000.

Lukach, Carl A.: *See*—
Kirkland, William J.; Lukach, Carl A.; and McLachlan, William C., 4,892,589, Cl. 106-197.100.

Lum, Wai Elliott: *See*—
Eastmond, Bruce C.; and Lum, Wai Elliott, 4,893,349, Cl. 455-205.000.

Lumbis, Anthony, to General Signal Corporation. Automatic coupler control system. 4,892,204, Cl. 213-1.600.

Lundquist, Timothy. Bird feeder. 4,892,060, Cl. 119-52.200.

Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., to Viskase Corporation. Irradiated multilayer film for primal meat packaging. 4,892,603, Cl. 156-244.110.

Lutron Electronics Co., Inc.: *See*—
D'Aleo, Michael J.; and Spira, Joel S., 4,893,062, Cl. 315-291.000.

Lutz, Gilbert F.: *See*—
Homer, John C.; Nowshiravani, Shahriar; Ross, Steven L.; and Lutz, Gilbert F., 4,893,315, Cl. 374-37.000.

Luyten, Peter R.; Den Hollander, Jan A.; Den Boef, Johannes H.; and Van Vaals, Johannes J., to U.S. Philips Corporation. Volume-selective spectroscopy using refocused echoes. 4,893,080, Cl. 324-309.000.

Luz Industries Israel, Ltd.: *See*—
Labaton, Isaac J., 4,892,142, Cl. 165-134.100.

LVI Group, Inc.: *See*—
Bowes, Stephen M., Jr., 4,891,893, Cl. 37-67.000.

Lynch, Peter G. Exercising device. 4,892,305, Cl. 272-127.000.

Lynn, Arthur E., Jr. Carbonated beverage bottle. 4,892,230, Cl. 222-105.000.

Lyons, Matthew V.: *See*—
Figgie, Harry E., III; Zarnowski, Alfred J.; and Lyons, Matthew V., 4,892,549, Cl. 623-22.000.

M. C. Aerospace Corporation: *See*—
Maroney, G. Earl; Dallas, Mark W.; West, Christopher; Diemer, John A.; and Chamberlin, Mark B., 4,892,114, Cl. 137-87.000.

MacDonald, Sumner B. Indicia device. 4,891,956, Cl. 63-3.000.

MacInnis, Martin B.: *See*—
Kasenga, Anthony F.; Gray, Leslie F.; Henson, Thomas L.; and MacInnis, Martin B., 4,892,757, Cl. 427-215.000.

MacKay, Carol A.: *See*—
Renk, Richard J.; Boller, George E.; and Ebert, Richard M., 4,892,000, Cl. 74-467.000.

MacLaughlin, Donald N., to Packaging Resources Incorporated. High barrier plastic container and method of making same. 4,892,227, Cl. 220-450.000.

Macri, James N.: *See*—
Sorensen, Keld; Macri, James N.; Douros, Timothy J.; Sajda, Paul; and Ippolito, Emiddio V., 4,892,405, Cl. 356-243.000.

Maeda, Akio: *See*—
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Maeda, Tsutomu; Matsui, Kiyoshi; Kanno, Takayuki; and Sato, Kunihiro, to TDK Corporation. Transformer with tapered core. 4,893,105, Cl. 336-84.00M.

Maegata, Shinji: *See*—
Ohm, Andreas; Luchtenberg, Helmut; Maegata, Shinji; and Opitz, Wolfgang, 4,892,741, Cl. 424-479.000.

Maehara, Toshifumi, to Akebono Brake Industry Co., Ltd.; and Akebono Research, Development Centre Ltd. Hydraulic pump. 4,892,468, Cl. 417-415.000.

Maehara, Yasunori: *See*—
Utsumi, Isao; Kawai, Yasuhiro; Tamura, Kaoru; Maehara, Yasunori; Fujiwara, Sigeme; and Koyama, Katsuhide, 4,892,199, Cl. 211-51.000.

Maeng, JoonYoul: *See*—
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Maezuru, Kaoru: *See*—
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Maginley, Ronald J.: *See*—
Robertson, David J.; Maginley, Ronald J.; Chapman, Alan S. J.; Thomas, Terence N.; Nizamuddin, Nadir; Williams, John W. J.; Redmond, Alan M.; and Morley, Robert S., 4,893,310, Cl. 370-110.100.

Magnin, Guy; Champeaud, Marie-Francoise; Aubert, Veronique; and Jaouen, Claude, to Societe Generale Pour Les Techniques Nouvelles S.G.N. Process for the immobilization of ion exchange resins originating from radioactive product reprocessing plants. 4,892,685, Cl. 252-628.000.

Magrane, Mark G., to General Electric Company. Calibration of phased array ultrasound probe. 4,893,284, Cl. 367-12.000.

Magurit Gefrierschneider GmbH: *See*—
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Mahler, Peter, to Leybold-Aktiengesellschaft. Apparatus for the quasi-continuous treatment of substrates. 4,892,451, Cl. 414-217.000.

Maier, Gerhard; and Armbruster, Veit, to Deutsche Thomson-Brandt GmbH. Audible antenna alignment apparatus. 4,893,288, Cl. 367-116.000.

Maignan, Jean; Lang, Gerard; Malle, Gerard; Restle, Serge; and Shroot, Braham, to L'Oreal. Aromatic naphthyl compounds, a process for their preparation and their use in human and veterinary medicine and in cosmetic compositions. 4,892,940, Cl. 536-55.200.

Maignan, Jean: *See*—
Shroot, Braham; Lang, Gerard; and Maignan, Jean, 4,892,864, Cl. 514-510.000.

Maione, Theodore E.: *See*—
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Makino, Kazumasa: *See*—
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Makovec, Leopold. Arrangement for water treatment. 4,892,655, Cl. 210-222.000.

Malcom, George E.: *See*—
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Malgo Corporation: *See*—
Goto, Takashi; and Malcom, George E., 4,892,368, Cl. 312-348.000.

Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, to Valmet Oy; and Kymmene Oy. Method for resisting formation of undulations in a fiber/water mixture during forming of a paper web in a paper-making machine. 4,892,622, Cl. 162-208.000.

Malladi, Madhava: *See*—
Choi, Byung; C.; Karsner, Grant G.; Lee, Chang-Kuei; Malladi, Madhava; and Milstein, Donald, 4,892,644, Cl. 208-107.000.

Malle, Gerard: *See*—
Maignan, Jean; Lang, Gerard; Malle, Gerard; Restle, Serge; and Shroot, Braham, 4,892,940, Cl. 536-55.200.

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Mallory Institute of Pathology Foundation: *See*—
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Manoff, Gilbert: *See*—
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Mansour, Azzam N.: *See*—
Glen, Daniel R.; Mansour, Azzam N.; O'Neill, Kathleen M.; Dalek, Steven; and Larrick, Benjamin F., 4,892,629, Cl. 204-56.100.

Mantele, Erwin, to Delma elektro- und medizinische Apparatebau GmbH. Pliers. 4,891,883, Cl. 30-190.000.

Manville Corporation: *See*—
Bainbridge, David W.; and Tocci, Mario P., 4,892,695, Cl. 264-119.000.
Manwell, John: *See*—
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Marcora, Giovanni; and Cataldo, Federico, to Ausimont S.p.A. Composition based on polytetrafluoroethylene suited for obtaining a self-lubricating layer on porous bronze bearings. 4,892,669, Cl. 252-30.000.
Maria De Bree, Cornelius H.; and Reincke, Marinus, to 501 Redexim B.V. Auxiliary tool for carefully levelling finishing floors. 4,891,888, Cl. 33-293.000.
Maroney, G. Earl; Dallas, Mark W.; West, Christopher; Diemer, John A.; and Chamberlin, Mark B., to M. C. Aerospace Corporation. Flow-sensing shutoff valve. 4,892,114, Cl. 137-87.000.
Marshall, Gerald M.: *See*—
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Marsili, Michael P.: *See*—
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Marstiller, John A.; Bodensiek, Paul H.; and Grise, Frederick G. J., to Flexwatt Corporation. Semi-conductive electrical heating device with voids. 4,892,998, Cl. 219-548.000.
Marten, Manfred: *See*—
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Martin, James H. Unit dose dispenser. 4,892,232, Cl. 222-207.000.
Martin, John R.: *See*—
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Martin, Joseph P.; and Zitomer, Kenneth J. Wastewater treatment system. 4,892,658, Cl. 210-617.000.
Maruyama, Akio: *See*—
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.
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Mason, Stanley I., Jr. Microwave cooking and serving dish. 4,892,213, Cl. 220-4.00B.
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Massey-Ferguson Services N.V.: *See*—
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Masson, Jean P. H. R. M.; Gollwitzer, Lee H.; and Lester, Robert A., to Schlumberger Technology Corporation. Method and apparatus for cement bond tool. 4,893,285, Cl. 367-35.000.
Mastercrafters Corporation: *See*—
Davidson, Samuel L., 4,892,054, Cl. 114-357.000.
Masuda, Eiji, to Kabushiki Kaisha Toshiba. Logical circuits for performing logical functions without a power supply. 4,893,031, Cl. 307-451.000.
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Matama, Toru; Suzuki, Kenji; Takahashi, Koji; and Suzuki, Tsuneo, to Fuji Photo Film Co., Ltd. Simulator for automatic photographic printing apparatus including inversion circuitry and spectral characteristic compensation. 4,893,178, Cl. 358-76.000.
Matsuda, Akira: *See*—
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Matsuda, Atsushi, to Asahi Kogaku Kogyo K.K. Focusing operation changeover apparatus for a camera. 4,893,145, Cl. 354-400.000.
Matsui, Kiyoshi: *See*—
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Matsumoto, Fumio, to Fuji Photo Film Co., Ltd. Method for detecting/processing image information. 4,893,345, Cl. 382-1.000.
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Matsumoto, Tadahiro; and Nishikawa, Kiyoshi, to Fuji Jukogyo Kabushiki Kaisha. Flexbeam for rotor blades of helicopter and method for fabrication thereof. 4,892,461, Cl. 416-134.00A.
Matsumoto, Takashi, to Hitachi, Ltd. Apparatus for testing an integrated circuit device. 4,893,072, Cl. 371-223.000.
Matsumoto, Yoshiyuki; Kume, Hidehiro; Mitsumori, Koji; Yoshitoshi, You; Yamamoto, Etsufumi; and Oinoue, Hiroshi, to Sony Corporation. Optical pickup device. 4,893,296, Cl. 369-112.000.
Matsunaga, Kuniyoshi: *See*—
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Matsuo, Ryosuke; and Koyanagi, Masaru, to Kabushiki Kaisha Toshiba. Power supply noise protection circuit. 4,893,029, Cl. 307-296.400.
Matsuoka, Hiroshi; and Ochiai, Masaki, to Bando Chemical Industries, Ltd. V-ribbed belt and the method of manufacturing the same. 4,892,510, Cl. 474-252.000.
Matsushima, Yuichi: *See*—
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Matsushita Electric Industrial Company, Ltd.: *See*—
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Matsushita Electrical Industrial Co., Ltd.: *See*—
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Matsushita Electronics Corporation: *See*—
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Matsuura, Ryo; Isobe, Nobuyuki; and Kase, Masao, to Pioneer Electronic Corporation. Front loading disk player. 4,893,295, Cl. 369-75.200.
Matsuzaki, Mikio: *See*—
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Mattar, Wade M.; Thompson, Duane T.; DeCarlo, Joseph P.; Hussain, Yousif; and Chitty, Gordon W., to Foxboro Company, The. Coriolis-type mass flowmeter. 4,891,991, Cl. 73-861.380.
Mattausch, Hans-Juergen; Matthiesen, Fred; and Schoebinger, Matthias, to Siemens Aktiengesellschaft. Arrangement for DPCM-coding with high data rate. 4,893,184, Cl. 358-135.000.
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Matumoto, Masaharu, to Ohi Seisakusho Co., Ltd. Electric locking device for lid. 4,892,340, Cl. 292-201.000.
Maury, Christian; Pham, Dan-Tam; and Richard, Jean-Marie, to Bull S.A. Magnetic writing and optical reading head for a data carrier. 4,893,207, Cl. 360-114.000.
Mauvieux, Christian; Gebelin, Bernard; and Herbaut, Philippe, to Framatome; and Compagnie Generale des Matieres Nucleaires. Device for measuring nuclear reactor fuel assembly grids. 4,892,701, Cl. 376-258.000.
Mavrakis, Gus H. Tackle box. 4,892,241, Cl. 224-216.000.
May, Phillip A., to Delco Electronics Corporation. Vehicle diplex doppler near-obstacle detection system. 4,893,125, Cl. 342-129.000.
Maydan, Dan: *See*—
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Mazda Motor Corporation: *See—*
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MBB GMBH: *See—*
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McClosky, Stan H.: *See—*
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McClure, Richard J., to Eastman Kodak Company. Magnetic erase head with terminator magnets on the ends. 4,893,208, Cl. 360-118.000.

McCullough, John E.; Dieckmann, John T.; and Hosmer, Thomas P., to Arthur D. Little, Inc. Compact scroll-type fluid compressor with swing-link driving means. 4,892,469, Cl. 418-55.000.

McDonald, Brian P.; and Collier-Hallman, Steven J., to General Motors Corporation. Electric circuit board current sensor. 4,893,073, Cl. 324-117.00H.

McDonald, Wallace L.: *See—*
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McFadyen, David J.: *See—*
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McGugan, John D.; Turner, William A.; and Hunt, Robert A. M., to Hunting Oilfield Services Limited. Clamping devices for use with elongate members. 4,892,280, Cl. 248-230.000.

McHenry, Robert J.: *See—*
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McKay, Douglas B.; Morten, Richard M.; and Marsili, Michael P., to International Business Machines Corporation. Method and apparatus for linking SNA terminals to an SNA host over a packet switched communications network. 4,893,307, Cl. 370-94.100.

McKee, John M.; and Burger, Marilyn S., to Motorola, Inc. Communication receiver having a remote alert device. 4,893,351, Cl. 455-347.000.

McKenna, John C. Orthodontic arch wire. 4,892,479, Cl. 433-20.000.

McLachlan, William C.: *See—*
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McLaurin, Leroy D.; and Toy, David Y. K., to Westinghouse Electric Corp. Fuel nozzle assembly for a gas turbine engine. 4,891,935, Cl. 60-39.370.

McLoughlin, Robert H.: *See—*
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McManus, Colin F.: *See—*
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McMillen, James C.: *See—*
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McMurtry, David R.; and Chaney, Raymond J., to Renishaw plc. Optical measuring apparatus for use on machines. 4,892,407, Cl. 356-375.000.

McNeel, William O.; Sackett, James A.; Wood, Joe N.; and Soliz, Julian, III, to Western Atlas International, Inc. Three-axis sensor. 4,893,290, Cl. 367-178.000.

McWilliams, Joseph A., to Micropore International Limited. Electric heaters. 4,892,997, Cl. 219-461.000.

Meadows, Margaret A. Sanitary condom case. 4,892,188, Cl. 206-223.000.

Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., to Baxter International Inc. Method of making a sterilizable multi-layer container. 4,892,604, Cl. 156-244.240.

Mebane IV, Alfred H.: *See—*
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Medinger, Bernhard: *See—*
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Medrad, Inc.: *See—*
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Sheinberg, Haskell; Meek, Thomas T.; and Blake, Rodger D., 4,892,581, Cl. 75-232.000.

Meguro, Kanji; and Nagaoka, Akinobu, to Takeda Chemical Industries, Ltd. Substituted heterocyclylalkyl esters of 1,4-dihydropyridine-3,5-dicarboxylic acids. 4,892,875, Cl. 514-253.000.

Mehaffey, Joseph L.; and Newman, Thomas C., to Akzo America Inc. Calcium carbonate beneficiation. 4,892,649, Cl. 209-166.000.

Meier, Stefan: *See—*
Noll, Tobias; and Meier, Stefan, 4,893,264, Cl. 364-724.100.

Melloul, Serge: *See—*
Cordier, Jean; Dussart, Bernard; Petit, Francis; Castanet, Yves; Melloul, Serge; and Mortreux, Andre , 4,892,976, Cl. 568-465.000.

Menasha Corporation: *See—*
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Mendelson, Leah T., to Union Oil Company of California. Lubricating compositions. 4,892,670, Cl. 252-37.000.

Mendoza, Abel: *See—*
Wang, Chun S.; Mendoza, Abel; and Fritz, David B., 4,892,925, Cl. 528-219.000.

Menke, Hans T.: *See—*
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Menke, James C.: *See—*
Rao, Bhaskara M. L.; Kobasz, William; and Menke, James C., 4,892,797, Cl. 429-210.000.

Mens, Wilhelmus R. M.: *See—*
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Merck & Co., Inc.: *See—*
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Saari, Walfred S., 4,892,951, Cl. 546-307.000.

Merck Patent Gesellschaft Mit Beschrankter Haftung: *See—*
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Merle, Joseph, to Opticast International Corporation. Composite plastic lens and method of making the same. 4,892,403, Cl. 351-168.000.

Merril, Carl R.: *See—*
Harrington, Michael G.; Merril, Carl R.; Asher, David M.; and Gajdusek, D. Carleton, 4,892,814, Cl. 435-5.000.

Merritt, Sears W.: *See—*
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Mertes, James L., to TRW Technar Inc. Thermostatically controlled in-line diesel fuel heater using a bimetal disc thermostat. 4,892,996, Cl. 219-301.000.

Merz, Theodore P.: *See—*
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Messier-Haspano-Bugatti: *See—*
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Messingschlager, Elisabeth: *See—*
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Messrs. Stetter GmbH, Dr. Karl-Lenz-Str.: *See—*
Riker, Rudolf, 4,892,441, Cl. 405-146.000.

Metal Box p.l.c.: *See—*
Ball, Martin F., 4,892,231, Cl. 222-207.000.

Metivier, Donald E., to Decibel Products, Inc. Adhesive mount mobile telephone antenna. 4,893,130, Cl. 343-715.000.

Metsaliiton Teollisuus OY: *See—*
Kairi, Matti O.; and Lehtonen, Markku S., 4,891,927, Cl. 52-642.000.

Metz, Doyle R.: *See—*
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Metz, Florence: *See—*
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Metz, Florence, executrix: *See—*
Metz, Jack L., deceased; and Metz, Florence, executrix, 4,892,531, Cl. 604-340.000.

Metz, Jack L., deceased; and by Metz, Florence, executrix, to Metz, Florence. Anti-seal device for use with ostomy appliances. 4,892,531, Cl. 604-340.000.

Meyer, Hans; and Steegmanns, Manfred, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Rail mounted ejector. 4,892,463, Cl. 417-151.000.

Meyer Machine Company: *See—*
Lassiter, Jimmie F., Jr.; and Slager, David R., 4,892,179, Cl. 198-365.000.

Meyer, Rolf-Volker; Dhein, Rolf; Dietrich, Michael; Bonten, Heinz; Heinz, Hans-Detlef; and Muller, Peter-Rolf, to Bayer Aktiengesellschaft. α-amino-ε-caprolactam-modified polyamide of dicarboxylic acids/diamines. 4,892,927, Cl. 528-324.000.

Meyer, Walter E.: *See—*
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Meyers, Richard S.; and Jones, Charles R., to Dana Corporation. Interlock assembly for a vehicle transmission. 4,892,001, Cl. 74-477.000.

Michael, William E.: *See—*
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Michaud-Soret, Jean A.: *See—*
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Micron Technology Inc.: *See—*
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Micronyx, Inc.: *See—*
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Micropore International Limited: *See—*
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Microscale Organic Laboratory Corporation: *See—*
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Microvoice Systems Corporation: *See—*
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Mihara, Teruyoshi; Hirota, Yukitsugu; Hiramoto, Yukio; and Matsushita, Tsutomu, to Nissan Motor Co., Ltd. MOSFET device. 4,893,158, Cl. 357-23.130.

Mikami, Akiko: *See*—
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Mikami, Naoko: *See*—
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Mikami, Seishin: *See*—
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Milbar Corporation: *See*—
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Milberger, Walter E.; Kerfoot, Charles S.; and Jones, Franklin B., to United States of America, Air Force. Domino effect shunt voltage regulator. 4,893,070, Cl. 323-270.000.
Miles, Charles B. Corn cutter and creamer. 4,892,034, Cl. 99-567.000.
Miles Inc.: *See*—
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Miles Laboratories, Inc.: *See*—
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Miller, Drexel R., to Cotter & Company. Handle bracket retainer. 4,892,434, Cl. 403-361.000.
Miller, Gabriel L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Capacitive incremental position measurement and motion control. 4,893,071, Cl. 324-660.000.
Miller, Gerhard; Strack, Helmut; and Tihanyi, Jenoe, to Siemens Aktiengesellschaft. Bipolar transistor controllable by field effect. 4,893,165, Cl. 357-43.000.
Miller, Josef M.; Pfingst, Bryan E.; Tjellstrom, Anders; and Albrektsson, Tomas, to University of Michigan, The Regents of the. Multichannel extracochlear implant. 4,892,108, Cl. 128-784.000.
Miller, Michael B.; and Bertin, Robert D., to Air Products and Chemicals, Inc. Graphite brazing fixture coated with composite layers of titanium carbide and titanium nitride. 4,892,788, Cl. 428-336.000.
Miller, Paul C., to Groundwater Technology, Inc. Decontamination of sites where organic compound contaminants endanger the water supply. 4,892,664, Cl. 210-747.000.
Miller, Roger K.: *See*—
Parker, Matt, III; Blom, Michael D.; and Miller, Roger K., 4,892,667, Cl. 210-799.000.
Mills, Norman T. Combined cutting tool and sharpener. 4,891,881, Cl. 30-123.000.
Milstein, Donald: *See*—
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Minamisono, Kenichi; Yasunaga, Masayuki; Watanbe, Fumio; and Baba, Noboru, to Kokusai Denshin Denwa Co., Ltd. Interference cancellation system. 4,893,350, Cl. 455-278.000.
Minemoto, Hideki; and Yamaguchi, Hisayuki, to Kabushiki Kaisha Taito. Operating device for TV game machine. 4,892,312, Cl. 273-148.00B.
Minigrip, Inc.: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
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Minolta Camera Kabushiki Kaisha: *See*—
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Minolta Camera Kabushiki Kasha: *See*—
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Mintzer, Joseph H. Illumination device for a hand-held remote control unit. 4,893,222, Cl. 362-109.000.
Mintzlaff, Richard P., to Danford Corporation. Computer disk drive assembly having a resiliently supported separable disk pack unit. 4,893,210, Cl. 360-137.000.
Mishkin, Martin A.: *See*—
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Mishra, Pradeep K.: *See*—
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Misumi, Masao; and Atsumi, Koji, to Oval Engineering Co., Ltd. Vortex flow meter. 4,891,989, Cl. 73-861.220.
Mitsubishi Chemical Industries Limited: *See*—
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Hara, Zenichiro; Kobayashi, Masaaki; Tatsuda, Kazunori; Terazaki, Nobuo; and Iwata, Shuji, 4,893,056, Cl. 313-495.000.
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Miwa, Hiromichi; Nagaishi, Hatsuo; Kishiki, Ichirou; and Koyama, Hirokimi, to Nissan Motor Company, Limited. System for measuring amount of air introduced into combustion chamber of internal combustion engine with avoiding influence of temperature dependent air density variation and pulsatile air flow. 4,892,072, Cl. 123-340.000.
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Miyata, Seizo; Watanabe, Toshiyuki; Goto, Yoshitaka; and Nakayama, Masaharu, to Nippon Oil and Fats Co., Ltd. Non-linear optical article. 4,892,681, Cl. 252-582.000.
Miyazaki, Kenichi: *See*—
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Miyazawa, Kazuyuki; Yamaguchi, Yasunori; and Kawamoto, Hiroshi, to Hitachi, Ltd. Semiconductor device. 4,893,157, Cl. 357-23.130.
Miyzawa, Yukimori, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Device for limiting direction of rotation of synchronous motor. 4,893,038, Cl. 310-83.000.
Mizoguchi, Yutaka: *See*—
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Mizuno, Koichi; Saito, Masahiro; Takahashi, Tadao; and Aizawa, Reize, to Director-General of Agency of Industrial Science and Technology. Catalyst and method for producing methanol from hydrogen and carbon monoxide. 4,892,855, Cl. 502-200.000.
Mizuno, Kozo; Fujisaki, Hideaki; Uda, Yoshinori; Imai, Tadashi; and Tsunemitsu, Katsuhiko, to Yamada Chemical Co., Ltd. Process for producing 1,1-diphenylallkenes. 4,892,973, Cl. 564-315.000.
Mizuno, Takeyuki; and Asami, Seiichi, to NGK Insulators, Ltd. Shaft composite structure between ceramic turbine rotor and metal member. 4,892,436, Cl. 403-404.000.
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Shimizu, Shumpei; Yoshizako, Mamoru; and Cho, Toshitsura, 4,892,625, Cl. 203-86.000.
Moss, Gaylord E., to Hughes Aircraft Company. Holographic rear window stoplight. 4,892,369, Cl. 350-3.700.
Motai, Noboru; Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; Suzuki, Yaeko; Ogiwara, Yoshihisa; Saito, Kazunori; and Shibuki, Keiko, to Nippon Precision Circuits Ltd.; and Seikosha Co., Ltd. Process for etching light-shielding thin film. 4,892,613, Cl. 156-643.000.
Motohashi, Michio: *See—*
Chonan, Hideo; Motohashi, Michio; Noguchi, Hirotaka; Ogawa, Kazuo; and Takahashi, Kimio, 4,892,372, Cl. 350-6.800.
Motorola, Inc.: *See—*
Alsup, Mitchell; Talgam, Yoav; and Denman, Marvin A., 4,893,267, Cl. 364-745.000.
Bright, Michael W.; Ziolko, Eric F.; Wilson, Alan L.; Bray, Michelle M.; Hennen, Harry A.; and Weiss, David L., 4,893,339, Cl. 380-28.000.
Budano, Joseph A., II; Guzik, Andrzei T.; Yorio, Rudy; and Cook, Harold M., 4,892,491, Cl. 439-582.000.
Bynum, Byron G.; and Jarrett, Robert B., 4,893,211, Cl. 361-18.000.
Davis, Walter L., 4,893,087, Cl. 328-14.000.
Davis, Walter L.; Herold, Barry W.; and Little, Wendell L., 4,893,271, Cl. 364-900.000.
Deem, Jake O., 4,893,266, Cl. 364-726.000.
Denman Marvin A.; and Talgam, Yoav, 4,893,233, Cl. 364-200.000.
Denman, Marvin A., Jr.; Young, John M.; and Alsup, Mitch K., 4,893,268, Cl. 364-759.000.
Eastmond, Bruce C.; and Linder, Donald L., 4,893,347, Cl. 455-52.000.
Eastmond, Bruce C.; and Lum, Wai Elliott, 4,893,349, Cl. 455-205.000.
Guzik, Andrzej T.; Yorio, Rudy; Budano, Joseph A., II; and Tellam, Mark, 4,892,486, Cl. 439-248.000.
Herold, Barry W.; and Tanernia, Omid, 4,893,094, Cl. 331-1.00A.
Hunter, Craig C.; and Spohrer, Thomas S., 4,893,311, Cl. 371-22.500.
Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., 4,893,316, Cl. 375-44.000.
McKee, John M.; and Burger, Marilyn S., 4,893,351, Cl. 455-347.000.
Seely, Warren L.; and Staudinger, Joseph, 4,893,098, Cl. 333-112.000.
Stern, Morton; and Williams, James, 4,893,327, Cl. 379-59.000.
Wilson, Alan L.; Bright, Michael W.; Bray, Michelle M.; Ziolko, Eric F.; and Weiss, David L., 4,893,308, Cl. 370-109.000.
Motta, Antonino, to SGS Microelettronica S.p.A. Method for decontamination of a chamber used in vacuum processes for deposition, etching and/or growth of high purity films. 4,892,615, Cl. 156-643.000.
Movats Incorporated: *See—*
Charbonneau, Arthur G.; Hale, Stanley N.; and Sayed, Edmond A., 4,891,975, Cl. 73-168.000.
Moynihan, John J., to GMX Parking Systems. Parking apparatus. 4,892,452, Cl. 414-229.000.
Mudge, Paul R., to National Starch and Chemical Corporation. Adhesive compositions for use on vinyl substrates. 4,892,917, Cl. 526-318.000.

Mueller, Harry B., to Modular Computer Systems, Inc. Device with openings for receiving pins of electrical components. 4,892,492, Cl. 439-828.000.

Mueller, Robert S.: *See*—
Damon, Gerald D.; and Mueller, Robert S., 4,892,178, Cl. 192-106.200.

Mukherjee, Satyendranath: *See*—
Wong, Stephen L.; and Mukherjee, Satyendranath, 4,893,212, Cl. 361-91.000.

Mulder, Hendrik, to B.V. Opische Industrie "De Oude Delft" . Image pickup device with exposure control based on pixel samples. 4,893,186, Cl. 358-213.190.

Muller, Jurgen: *See*—
Bauer, Walter; Muller, Jurgen; and Voigtlander, Volkmar, 4,893,011, Cl. 250-327.200.

Muller, Karl, to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft. Needling apparatus for making a patterned felt web. 4,891,870, Cl. 028-107.000.

Muller, Marcel: *See*—
Alig, Leo; and Muller, Marcel, 4,892,886, Cl. 514-567.000.

Muller, Peter-Rolf: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Dietrich, Michael; Bonten, Heinz; Heinz, Hans-Detlef; and Muller, Peter-Rolf, 4,892,927, Cl. 528-324.000.

Mullier, Graham W.: *See*—
Gallagher, Peter T.; Hicks, Terence A.; and Mullier, Graham W., 4,892,963, Cl. 558-414.000.

Mulrow, Robert J.: *See*—
Pankonen, Andrew W.; Jester, Donald J.; Mulrow, Robert J.; Modica, Catherine P.; and Zdenek, John M., 4,893,325, Cl. 379-45.000.

Munchbach, George E.: *See*—
Walton, Richard R.; and Munchbach, George E., 4,892,298, Cl. 271-18.300.

Munroe, John E., to Eli Lilly and Company. 1-carbacephalosporin antibiotics. 4,892,942, Cl. 540-205.000.

Murai, Hideya: *See*—
Hayashi, Hideo; Murai, Hideya; and Inaba, Nobuyuki, 4,892,912, Cl. 525-437.000.

Murai, Ryukichi: *See*—
Takeshima, Kiyoshi; and Murai, Ryukichi, 4,891,867, Cl. 24-408.000.

Murakami, Kouji: *See*—
Nishiwaki, Satoru; Takahashi, Yukinobu; Murakami, Kouji; and Fukuda, Norisuke, 4,893,214, Cl. 361-286.000.

Murakami, Tadashi: *See*—
Tomita, Kazuo; Murakami, Tadashi; Tsuji, Hideakira; Matsumoto, Keigo; and Fujita, Katsuhiro, 4,892,882, Cl. 514-380.000.

Murakami, Takatoshi; Kida, Toshio; Kon, Shiji; Asai, Toshinobu; and Nunome, Yoshiyuki, to Showa Electric Wire & Cable Co., Ltd. Method for producing a rubber or plastic-coated roller. 4,892,696, Cl. 264-219.000.

Murakami, Tatsuya; Fujisawa, Hiromichi; Fujinawa, Masaaki; and Hananoi, Toshihiro, to Hitachi, Ltd. Document image entry system. 4,893,188, Cl. 358-456.000.

Murphy, Patrick K.: *See*—
Snider, S. Duke; Dohogne, L. Ranney; and Murphy, Patrick K., 4,893,041, Cl. 310-215.000.

Mutsukado, Motoo; Tanikawa, Keizo; Shikada, Ken-ichi; and Sakoda, Ryozo, to Nissan Chemical Industries Ltd. 3(2H)Pyridazinone, process for its preparation and anti-allergic agent containing it. 4,892,947, Cl. 514-247.000.

Myers, Brent A.; and Wiles, William W., Jr., to Harris Corporation. Transimpedance focal plane processor. 4,893,088, Cl. 328-127.000.

Myers, Stephen M., to Compaq Computer Corporation. Support apparatus for portable computer expansion unit. 4,893,263, Cl. 364-708.000.

N.A.I. Acoustical Interiors, Inc.: *See*—
Pingston, Robert D., 4,891,920, Cl. 52-145.000.

NACAM: *See*—
Haldric, Bernard; and Baudon nee Chardon, Sylvie, 4,892,007, Cl. 74-552.000.

Nadaradjane, Ramatchandirane: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Antonio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, 4,893,309, Cl. 370-110.100.

Nagai, Keiichi: *See*—
Watanabe, Kenichi; Simada, Tamotu; Nagai, Keiichi; Tokita, Jirou; Nakano, Ryusei; and Sumitani, Tomoaki, 4,892,638, Cl. 204-299.00R.

Nagaishi, Hatsuo: *See*—
Miwa, Hiromichi; Nagaishi, Hatsuo; Kishiki, Ichirou; and Koyama, Hirokimi, 4,892,072, Cl. 123-340.000.

Naganawa, Kazutomo: *See*—
Shimomura, Tooru; Naganawa, Kazutomo; Tanamura, Toshiya; and Nagao, Toshiaki, 4,893,230, Cl. 364-146.000.

Nagano, Masashi, to Shimano Industrial Company Limited. End cap for an outer cable. 4,892,005, Cl. 74-502.400.

Nagao, Toshiaki: *See*—
Shimomura, Tooru; Naganawa, Kazutomo; Tanamura, Toshiya; and Nagao, Toshiaki, 4,893,230, Cl. 364-146.000.

Nagaoka, Akinobu: *See*—
Meguro, Kanji; and Nagaoka, Akinobu, 4,892,875, Cl. 514-253.000.

Nagata, Shunji: *See*—
Takagishi, Yasushi; Ogura, Toshihiro; Sasaki, Kenji; and Nagata, Shunji, 4,892,738, Cl. 424-468.000.

Nagy, Joseph G.; and Jaspering, Daniel L., to United States of America, Air Force. Solid fuel burn enhancer. 4,891,938, Cl. 60-245.000.

Nahill, George F.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,892,699, Cl. 264-328.800.

Naito, Hisayuki: *See*—
Suenaga, Jun-ichi; Naito, Hisayuki; and Sasaki, Singo, 4,892,926, Cl. 528-305.000.

Najdovski, Lupcho: *See*—
Akeel, Hadi A.; McClosky, Stan H.; and Najdovski, Lupcho, 4,892,992, Cl. 219-121.780.

Nakagawa, Kouji: *See*—
Asada, Takafumi; Kataoka, Jiro; and Nakagawa, Kouji, 4,892,418, Cl. 384-124.000.

Nakagawa, Takashi: *See*—
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 4,892,924, Cl. 528-196.000.

Nakajima, Hideyuki: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Suzuki, Yoshiyuki; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,892,722, Cl. 423-448.000.

Nakamine, Takeshi; and Sato, Kozo, to Fuji Photo Film Co., Ltd. Heat sensitive transfer materials. 4,892,858, Cl. 503-227.000.

Nakamura, Arata, to Omron Tateisi Electronics Co. Reflection type photoelectric switch for detecting the presence of an object. 4,893,004, Cl. 250-221.000.

Nakamura, Motohiko, to Nissho Corporation. Container having injection needle-detaching means. 4,892,191, Cl. 206-366.000.

Nakamura, Sadao, to Kabushiki Kaisha Toshiba. Method and apparatus for parallel computation. 4,893,303, Cl. 370-60.000.

Nakamura, Shoichi; and Suzuki, Tadao, to Sony Corporation. Disc recording medium and apparatus for playback thereof. 4,893,193, Cl. 358-341.000.

Nakamura, Yasuhide: *See*—
Ohnishi, Souichi; Nakamura, Yasuhide; Komai, Kensaku; and Goto, Kazuyuki, 4,893,236, Cl. 364-405.000.

Nakamura, Yukinobu: *See*—
Iihoshi, Akira; Nakamura, Yukinobu; and Yasui, Shinichiro, 4,893,246, Cl. 364-449.000.

Nakano, Ryusei: *See*—
Watanabe, Kenichi; Simada, Tamotu; Nagai, Keiichi; Tokita, Jirou; Nakano, Ryusei; and Sumitani, Tomoaki, 4,892,638, Cl. 204-299.00R.

Nakano, Taku: *See*—
Dolphin, David H.; Nakano, Taku; Kirk, Thomas K.; Wijesekera, Tilak P.; Farrell, Roberta L.; and Maione, Theodore E., 4,892,941, Cl. 540-145.000.

Nakanome, Heikichi; and Yonezawa, Takeshi, to Yokohama Rubber Co., Ltd., The. Automatic material feeder in tire forming machine. 4,892,609, Cl. 156-406.400.

Nakao, Hirotake, to Aisin Seiki Kabushiki Kaisha. Closure for triangular window in a vehicle body. 4,891,909, Cl. 49-391.000.

Nakata, Takashi: *See*—
Tanabe, Kazunori; Suzuki, Makoto; Makino, Kazumasa; Shibata, Eiji; Ishida, Kazuhito; Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 4,893,147, Cl. 355-27.000.

Nakayama, Masaharu: *See*—
Miyata, Seizo; Watanabe, Toshiyuki; Goto, Yoshitaka; and Nakayama, Masaharu, 4,892,681, Cl. 252-582.000.

Nakayama, Masatoshi; Takasugi, Yasufumi; and Ueda, Kunihiro, to TDK Corporation. Magnetic recording medium. 4,892,789, Cl. 428-336.000.

Nakhgevany, Karim B. Endotracheal tube. 4,892,095, Cl. 128-207.140.

Nalepa, Philip J.: *See*—
Tillman nee Caruso, Nancy J.; and Nalepa, Philip J., 4,893,057, Cl. 313-631.000.

Namikoshi, Hajime: *See*—
Shibata, Tohru; Namikoshi, Hajime; and Okamoto, Ichiro, 4,892,659, Cl. 210-635.000.

Narang, Rajendra K. Clothes dryer and laundry system. 4,891,892, Cl. 34-86.000.

Narayanan, Krishna; and Liang, Marc D., to Montefiore Hospital Association of Western Pennsylvania. Breast marking device. 4,892,096, Cl. 606-1.000.

Nariki, Toshio: *See*—
Morino, Seiji; Kawamoto, Satoru; Yoshitani, Yoshihiro; Sugimoto, Toshio; and Nariki, Toshio, 4,892,080, Cl. 123-604.000.

Naritsuka, Shigeya: *See*—
Hatakoshi, Genichi; Itaya, Kazuhiko; Naritsuka, Shigeya; Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Watanabe, Yukio; Ohba, Yasuo; Kokubun, Yoshihiro; and Uematsu, Yutaka, 4,893,313, Cl. 372-46.000.

Naruse, Jun: *See*—
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Nasatka Barrier, Inc.: *See*—
Nasatka, Kenneth F., 4,893,119, Cl. 340-928.000.

Nasatka, Kenneth F., to Nasatka Barrier, Inc. Method and apparatus for operating a vehicle barricade. 4,893,119, Cl. 340-928.000.

Naseem, Homaira, to Gary Chemical Corporation. Flame retardant low smoke poly(vinyl chloride) thermoplastic compositions. 4,892,683, Cl. 252-609.000.

Nathanson, James A., to General Hospital Corporation, The. Azido-substituted octopamine agonists and the use thereof to control invertebrate pests. 4,892,871, Cl. 514-227.200.

National Research Development Corporation: *See*—
Rogers, Philip S.; Rawlings, Rees D.; and Kim, Hyung S., 4,892,846, Cl. 501-8.000.

National Starch and Chemical Corporation: *See*—
Leighton, John C.; and Sanders, Michael J., 4,892,898, Cl. 524-3.000.
Mudge, Paul R., 4,892,917, Cl. 526-318.000.
Pangrazi, Ronald; and Walker, James L., 4,892,785, Cl. 428-288.000.

Nativi, Larry A.: *See*—
Drain, Kieran F.; Nativi, Larry A.; and Thompson, Richard T., 4,892,764, Cl. 428-34.500.

Naudin, Jacky; and Alas, Jacques, to Valeo. Torsion damping device. 4,892,008, Cl. 74-574.000.

Nayar, Shree K., to Carnegie-Mellon University. Robotic vision system. 4,893,183, Cl. 358-107.000.

Nayuki, Shin-ichi: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Suzuki, Yoshiyuki; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,892,722, Cl. 423-448.000.

NCR Corporation: *See*—
Henderson, David L.; Herbert, Brian K.; Lahey, Michael D.; and Robbins, Jamey L., 4,893,116, Cl. 340-747.000.

Nebel, David J.: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,892,261, Cl. 241-301.000.

NEC Corporation: *See*—
Hirosaki, Botaro, 4,893,265, Cl. 364-724.100.
Okamoto, Toshiyuki, 4,893,092, Cl. 330-253.000.
Yamada, Tadaharu; Watanabe, Makoto; and Terada, Yoshihiro, 4,893,204, Cl. 360-103.000.

Neece, Roy M. Adjustable lens shield assembly for vehicular lights. 4,893,226, Cl. 362-376.000.

Neenan, Thomas X.; and Whitesides, George M., to President and Fellows of Harvard College. Diethynyl monomers and polymers thereof. 4,892,975, Cl. 568-56.000.

Nellett, Suzanne: *See*—
Kittridge, John H.; and Nellett, Suzanne, 4,892,401, Cl. 350-626.000.

Nelson, Edward J.: *See*—
Carmen, Raleigh A.; Leng, Barry S.; Lewis, Willie J.; and Nelson, Edward J., 4,892,537, Cl. 604-408.000.

Neogi, Amar N.: *See*—
Perdelwitz, Lee E., Jr.; Gaddis, Paul G.; Iff, Ron H.; Cotie, Michael E.; and Neogi, Amar N., 4,892,769, Cl. 428-68.000.

Neoprobe Corporation: *See*—
Denen, Dennis J.; Thurston, Marlin O.; and Ramsey, Raymond C., 4,893,013, Cl. 250-336.100.

Nestor, Charles R.; and Yurtin, John A., to General Motors Corporation. Ignition cable termination assembly and method of making same. 4,892,488, Cl. 439-438.000.

Neuenschwander, Kent W.; and Scotese, Anthony C., to Rorer Pharmaceutical Corporation. Novel hmg-coa reductase inhibitors. 4,892,884, Cl. 514-460.000.

Neuer, Bernd, to SKW Trostberg Aktiengesellschaft. Lead-containing additive for steel melts. 4,892,580, Cl. 75-53.000.

New England Deaconess Hospital Corporation: *See*—
Salem, Ronald R.; Thomas, Peter; Zamcheck, Norman; and Steele, Glenn, 4,892,933, Cl. 530-387.000.

Newco Research Corporation: *See*—
Webster, Joseph P.; and Gustafson, William L., 4,892,031, Cl. 99-284.000.

Newkirk, Marc S., to Lanxide Technology Company, LP. Ceramic articles with a polymer component and methods of making same. 4,892,786, Cl. 428-307.300.

Newman, Howard G.; Monette, David G.; Koczara, Michael D.; Ribant, Duane J.; Papke, Ronald D.; Bien, Alfred A.; and Hawkins, Richard A., to Chrysler Motors Corporation. Vehicle door handle mounting arrangement. 4,892,342, Cl. 292-347.000.

Newman, James J. Ozone generator. 4,892,713, Cl. 422-186.070.

Newman, Thomas C.: *See*—
Mehaffey, Joseph L.; and Newman, Thomas C., 4,892,649, Cl. 209-166.000.

NGK Insulators, Ltd.: *See*—
Mizuno, Takeyuki; and Asami, Seiichi, 4,892,436, Cl. 403-404.000.

NGK Spark Plug Co., Ltd.: *See*—
Iio, Satoshi; and Okuno, Akiyasu, 4,892,703, Cl. 419-13.000.

Ngo, That T.: *See*—
Wong, Raphael C.; and Ngo, That T., 4,892,710, Cl. 422-102.000.

N'Guyen, Annick: *See*—
Gueguen, Jean-Pierre; N'Guyen, Annick; and Pottier, Jacques, 4,893,058, Cl. 315-5.000.

Niagara Lockport Industries Inc.: *See*—
Brown, Charles M., 4,892,121, Cl. 139-185.000.

Nicastro, Antonio: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Antonio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, 4,893,309, Cl. 370-110.100.

Niccum, Leonard M.: *See*—
Zook, Eldon A.; and Niccum, Leonard M., 4,892,052, Cl. 114-85.000.

Nichols, Robert K.: *See*—
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.

Nickerson, Mark A. Trapping assembly. 4,892,654, Cl. 210-198.200.

Nico-Pyrotechnik Hanns-Jurgen Diederichs GmbH & Co. KG: *See*—
Lubbers, Willi, 4,892,038, Cl. 102-439.000.

Nicolas, Pierre: *See*—
Cohen, Paul; Morel, Alain; Gomez, Sophie; Clamagirand, Christine M.; Gluschankof, Pablo; Nicolas, Pierre; and Boussetta, Hamadi, 4,892,813, Cl. 435-4.000.

Niederer, Gino; and Frey, Otto, to Gebruder Sulzer; and Protek AG. Joint socket. 4,892,548, Cl. 623-22.000.

Nieh, Edward C. Y., to Texaco Chemical Company. Preparation of nonionic surfactants by oxyalkylation with a magnesium catalyst. 4,892,977, Cl. 568-618.000.

Nieto-Busby, Adriana; and Nieto, Guadalupe. Child's portable auxiliary seat cushion with upper body support ridge. 4,892,357, Cl. 297-464.000.

Nieto, Guadalupe: *See*—
Nieto-Busby, Adriana; and Nieto, Guadalupe, 4,892,357, Cl. 297-464.000.

Nihon Kohden Corp.: *See*—
Ito, Meiichi; Kuriyagawa, Kazuya; Adachi, Hitoshi; and Ohno, Kohei, 4,892,104, Cl. 128-697.000.

Nihon Plast Co., Ltd.: *See*—
Endo, Tetsuji; and Nishijima, Kazuyoshi, 4,892,006, Cl. 74-552.000.

Nihon Sinku Gijutsu Kabushiki Kaisha: *See*—
Watanabe, Kazuhiro; Saito, Kazuya; Yuchi, Yoshiyuki; and Inagawa, Konosuke, 4,892,791, Cl. 428-698.000.

Nilssen, Ole K. Electronic ballast with safety feature. 4,893,059, Cl. 315-127.000.

Nilssen, Ole K. Operating system for skin treatment apparatus. 4,893,064, Cl. 315-317.000.

Nippon Air Brake Co., Ltd.: *See*—
Kojima, Katsumi, 4,892,569, Cl. 55-163.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Takeuchi, Akihiko; and Mizuguchi, Masaaki, 4,892,023, Cl. 84-687.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Hoshino, Hiroo; and Shimada, Nobuyoshi, 4,892,876, Cl. 514-265.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Yoneyama, Seiichi, 4,892,059, Cl. 119-3.000.

Nippon Oil Co., Ltd.: *See*—
Ishida, Noboru, 4,892,680, Cl. 252-565.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Miyata, Seizo; Watanabe, Toshiyuki; Goto, Yoshitaka; and Nakayama, Masaharu, 4,892,681, Cl. 252-582.000.

Nippon Piston-Ring Co., Ltd.: *See*—
Kawaguchi, Takashi; Fujita, Yoshiaki; and Kawai, Satoshi, 4,891,972, Cl. 73-119.00R.

Nippon Precision Circuits Ltd.: *See*—
Motai, Noboru; Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; Suzuki, Yaeko; Ogiwara, Yoshihisa; Saito, Kazunori; and Shibuki, Keiko, 4,892,613, Cl. 156-643.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Katahira, Masayuki, 4,892,415, Cl. 384-45.000.

Nippon Seimitsu Kogyo Kabushiki Kaisha: *See*—
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Nippon Shokubai Kagaku, Co., Ltd.: *See*—
Shioji, Shobu; Sasabe, Masazumi; Dairoku, Yorimichi; and Fujiwara, Teruaki, 4,892,902, Cl. 524-417.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Kawajiri, Tatsuya; Uchida, Shinichi; and Wada, Masahiro, 4,892,856, Cl. 502-247.000.

Nippon Soken, Inc.: *See*—
Kodera, Masao; and Mikami, Seishin, 4,893,129, Cl. 343-700.0MS.

Nippon Steel Corporation: *See*—
Kato, Yoichiro; Takao, Hiroyuki; Koga, Yasuhide; and Takashima, Tsuguro, 4,892,293, Cl. 266-193.000.

Nippondenso Co., Ltd.: *See*—
Fujii, Tetsuo; and Itoh, Osamu, 4,891,984, Cl. 73-517.00R.
Kondo, Ryoji, 4,893,051, Cl. 313-141.000.
Kozaki, Tetsuji; Shimamoto, Mamoru; and Oonuma, Toshio, 4,892,329, Cl. 280-772.000.
Morino, Seiji; Kawamoto, Satoru; Yoshitani, Yoshihiro; Sugimoto, Toshio; and Nariki, Toshio, 4,892,080, Cl. 123-604.000.
Yamamoto, Noboru; Tsujimura, Masakuni; Sasaki, Kiyotaka; Kato, Kouichi; Tani, Hideji; Ito, Yasuo; Matsui, Takeshi; and Hashimoto, Kenji, 4,892,073, Cl. 123-417.000.

Nishida, Masaaki; and Hayakawa, Youichi, to Aisin-Warner Kabushiki Kaisha. Planetary gear mechanism on an automatic transmission. 4,892,011, Cl. 74-761.000.

Nishihira, Keigo; Yamashita, Masayoshi; and Yoshida, Hiroshi, to Ube Industries, Ltd. 2-methyl-4-amino-5-aminomethylpyrimidine carbonate, process for preparing the same and method of purification of 2-methyl-4-amino-5-aminomethylpyrimidine using the same. 4,892,948, Cl. 544-326.000.

Nishii, Michiharu; and Tada, Yoshihiko, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake booster. 4,892,361, Cl. 303-114.000.

Nishijima, Kazuyoshi: *See*—
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Nishijima, Mitsuru: *See*—
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Nishikawa, Kiyoshi: *See*—
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Nishimu Electronics Industries Co., Ltd.: *See*—
Harada, Kosuke; Katsuki, Akihiko; and Tominaga, Fukutoshi, 4,893,069, Cl. 323-215.000.
Nishimura, Mizuho: *See*—
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Nishitani, Yasuhiro: *See*—
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Nishiwaki, Satoru; Takahashi, Yukinobu; Murakami, Kouji; and Fukuda, Norisuke, to Kabushiki Kaisha Toshiba. Capacitance type sensitive element and a manufacturing method thereof. 4,893,214, Cl. 361-286.000.
Nishiyama, Hisai, to Yoshida Kogyo K. K. Apparatus for simultaneously coating a plurality of surface type fastener tapes or like strips. 4,892,760, Cl. 427-428.000.
Niskala, Wayne F.: *See*—
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Nissan Chemical Industries Ltd.: *See*—
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Nohira, Hiroyuki; Arai, Kazutaka; and Yoshinaga, Kazuo, 4,892,675, Cl. 252-299.010.
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Iriyama, Masahiro, 4,892,074, Cl. 123-425.000.
Iriyama, Masahiro; and Satoh, Hiroshi, 4,892,075, Cl. 123-425.000.
Mihara, Teruyoshi; Hirota, Yukitsugu; Hiramoto, Yukio; and Matsushita, Tsutomu, 4,893,158, Cl. 357-23.130.
Miwa, Hiromichi; Nagaishi, Hatsuo; Kishiki, Ichirou; and Koyama, Hirokimi, 4,892,072, Cl. 123-340.000.
Sasaki, Akira; and Sakuma, Yuichi, 4,892,168, Cl. 181-250.000.
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Nissho Corporation: *See*—
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Noble, Bradley T.: *See*—
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Nogami, Ikuo: *See*—
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Noguchi, Hirotaka: *See*—
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Noguchi, Yoshiki; and Hattori, Youichi, to Hitachi, Ltd. Heat recovery system. 4,891,937, Cl. 60-39.182.
Nohira, Hiroyuki; Arai, Kazutaka; and Yoshinaga, Kazuo, to Canon Kabushiki Kaisha; and Nissan Chemical Industries, Ltd. Optically active polymer and liquid crystal composition containing same. 4,892,675, Cl. 252-299.010.
Noll, Tobias; and Meier, Stefan, to Siemens Aktiengesellschaft. Digital decimation filter. 4,893,264, Cl. 364-724.100.
Nomura, Takeshi: *See*—
Shimizu, Hiroshi; Ozawa, Naohiro; Gotoh, Toshihiko; Hamma, Kentaro; and Nomura, Takeshi, 4,892,425, Cl. 400-120.000.
Norbury, Raymond L., Jr.; Baker, John W.; and Poynter, Vernon L., to Cary Products Co., Inc. Air flow louver system. 4,892,288, Cl. 251-306.000.
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Norling, Brian L., to Sundstrand Data Control, Inc. Temperature compensation of a steady-state accelerometer. 4,891,982, Cl. 73-497.000.
Norman, John A., to Uarco Incorporated. Postcard with tear out return postcard. 4,892,246, Cl. 229-92.800.
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Norster, Eric R.: *See*—
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North American Philips Corp.: *See*—
Tillman nee Caruso, Nancy J.; and Nalepa, Philip J., 4,893,057, Cl. 313-631.000.
Wong, Stephen L.; and Mukherjee, Satyendranath, 4,893,212, Cl. 361-91.000.
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Nowicki, Neal R.; and Lowry, James D., Jr., to Amoco Corporation. Staged aromatics oxidation in aqueous systems. 4,892,970, Cl. 22-413.000.
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Nutrasweet Company, The: *See*—
Hill, John B.; and Roczniak, Steven O., 4,892,820, Cl. 435-68.100.
Nutting, Donald W. Cardboard coffin and method for forming the same. 4,891,869, Cl. 27-4.000.
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O'Brien, Terry D. Call deferral system for telephones. 4,893,329, Cl. 379-88.000.
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O'Donnell, William P., to Avanti International. Portable ladder assembly. 4,892,170, Cl. 182-100.000.
Ogasawara, Tatsuo, to Kabushiki Kaisha Toshiba. Ultrasonic scanning pulse-generating apparatus. 4,892,103, Cl. 128-660.010.
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Ohata, Keiichi, to General Electric Company. Heterojunction field effect transistor device and process of fabrication thereof. 4,893,155, Cl. 357-22.000.
Ohba, Toshihiro; Kanatani, Yoshiharu; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Drive circuit for a thin-film electroluminescent display panel. 4,893,060, Cl. 315-169.300.
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Matumoto, Masaharu, 4,892,340, Cl. 292-201.000.
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Ohnishi, Souichi; Nakamura, Yasuhide; Komai, Kensaku; and Goto, Kazuyuki, to Sharp Kabushiki Kaisha. Electronic cash register. 4,893,236, Cl. 364-405.000.
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Okada, Kentaro, to Sony Corporation. Digital signal recording apparatus with a digital subdata converting capability. 4,893,199, Cl. 360-48.000.
Okajima, Yoshiaki, to Sanden Corporation. Partition wall for packing compressors. 4,892,196, Cl. 206-523.000.
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O'Neil, Robert M.; and Payne, John D., to Ciba-Geigy Corporation. 2-Propanol derivatives as corrosion inhibitors. 4,892,671, Cl. 252-51.50R.
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Ono, Jun; Iso, Yuichiro; and Ise, Hiroshi, to Honda Giken Kogyo K.K. Water drain trough for automotive sunroof. 4,892,351, Cl. 296-213.000.
Ono, Katsuhiro, to Kabushiki Kaisha Toshiba. X-ray fluorescent image intensifier. 4,893,020, Cl. 250-483.100.
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Otte, Bernd: *See*—
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Ottestad, Jack B. Bucket system with percussive penetration member. 4,892,358, Cl. 299-37.000.

Ottestad, Jack B. Bucket system with percussive penetration member. 4,892,359, Cl. 299-37.000.

Otto Hansel GmbH: *See*—
Hogenkamp, Wilhelm, 4,892,181, Cl. 198-434.000.

Outboard Marine Corporation: *See*—
Brown, Peter W., 4,892,066, Cl. 123-73.00V.
Ferguson, Arthur R., 4,892,494, Cl. 440-61.000.

Ouyang, Kenneth W.: *See*—
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Oval Engineering Co., Ltd.: *See*—
Misumi, Masao; and Atsumi, Koji, 4,891,989, Cl. 73-861.220.

Overweg, Johannes A.; and Mens, Wilhelmus R. M., to U.S. Philips Corporation. Magnetic resonance apparatus comprising integrated gradient r.f. coils. 4,893,083, Cl. 324-318.000.

Owen, Hartley: *See*—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,892,643, Cl. 208-70.000.

Owen, S. Hudson, to Koppers Industries, Inc. Railroad grade crossing with improved transverse spline and anchoring assembly. 4,892,249, Cl. 238-8.000.

Oxford, Stuart G. All-terrain wheelchair. 4,892,323, Cl. 280-250.100.

Oyabu, Masaaki: *See*—
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Ozawa, Masayuki: *See*—
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Ozawa, Naohiro: *See*—
Shimizu, Hiroshi; Ozawa, Naohiro; Gotoh, Toshihiko; Hamma, Kentaro; and Nomura, Takeshi, 4,892,425, Cl. 400-120.000.

Paar, Willibald, to Vianova Kunstharz, A.G. Novel crosslinking components containing biuret groups for cationic paint binders. 4,892,913, Cl. 525-452.000.

Pace, Laurel J.: *See*—
Vegh, Bertalan J.; and Pace, Laurel J., 4,892,616, Cl. 156-655.000.

Pacific Bell: *See*—
Lubarsky, Daniel P.; Weigt, George A.; and Haisch, Mark E., 4,893,340, Cl. 380-50.000.

Packaging Resources Incorporated: *See*—
MacLaughlin, Donald N., 4,892,227, Cl. 220-450.000.

Paige, Marshall A., to United States of America, Navy. Man portable shallow water structure. 4,892,445, Cl. 405-224.000.

Palibroda, James W. Containerized transportable house. 4,891,919, Cl. 52-79.500.

Palone, Thomas W.: *See*—
Long, Michael; Palone, Thomas W.; and Kemp, Paul, 4,892,243, Cl. 226-97.000.

Paneth, Eric: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,893,317, Cl. 375-97.000.

Pangrazi, Ronald; and Walker, James L., to National Starch and Chemical Corporation. Heat resistant binders. 4,892,785, Cl. 428-288.000.

Pankonen, Andrew W.; Jester, Donald J.; Mulrow, Robert J.; Modica, Catherine P.; and Zdenek, John M., to Rockwell International Corporation. Integrated public safety answering point system. 4,893,325, Cl. 379-45.000.

Papke, Ronald D.: *See*—
Newman, Howard G.; Monette, David G.; Koczara, Michael D.; Ribant, Duane J.; Papke, Ronald D.; Bien, Alfred A.; and Hawkins, Richard A., 4,892,342, Cl. 292-347.000.

Parconagian, Doris L.; DeVries, Donald H.; Costales, Mark J.; and Reifschneider, Walter, to Dow Chemical Company, The. Method and composition for enhancing the insecticidal activity of certain organophosphorus compounds. 4,892,732, Cl. 424-409.000.

Parikh, Dakshesh D.: *See*—
Rahman, Mahboob F.; Parikh, Dakshesh D.; Daly, Marita E.; and Wang, Bu-Chin, 4,893,279, Cl. 365-230.030.

Park, George B.; Cook, John A.; and McLoughlin, Robert H., to Scimat Limited. Electrode article. 4,892,559, Cl. 29-623.300.

Park, In P.: *See*—
Park, Sea C.; and Park, In P., 4,893,113, Cl. 340-632.000.

Park, Sea C.; and Park, In P. Gas alarm and detoxification heating systems. 4,893,113, Cl. 340-632.000.

Parker Hannifin Corporation: *See*—
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Parker, Matt, III; Blom, Michael D.; and Miller, Roger K., to Kaydon Corporation. Method and means for dewatering lubricating oils. 4,892,667, Cl. 210-799.000.

Parl, Steen A.; and Pierce, John N., to United States of America, Air Force. Troposcatter diversity sidelobe jamming suppressor. 4,893,128, Cl. 342-379.000.

Parnello, Nicholas G., to Power Play. Intercommunication system for telephones. 4,893,334, Cl. 379-157.000.

Parris, Michael: *See*—
Eaton, S. Sheffield, Jr.; Butler, Douglas; and Parris, Michael, 4,893,272, Cl. 365-145.000.

Parslow, Harold W., Jr.; and Parslow, Timothy M., to GraPar Corporation. Production line part cleaning apparatus. 4,892,111, Cl. 134-66.000.

Parslow, Timothy M.: *See*—
Parslow, Harold W., Jr.; and Parslow, Timothy M., 4,892,111, Cl. 134-66.000.

Pasman, Johannes H. T.; and Van Hijningen, Nicolaas C. J. A., to U.S. Philips Corporation. Record-carrier body provided with a relief structure of optically detectable servo-track portions and sector addresses and apparatus for forming said structure. 4,893,298, Cl. 369-275.000.

Pastan, Ira H.; Adhya, Sankar; and Fitzgerald, David, to United States of America, Health and Human Services. Recombinant pseudomonas exotoxins: construction of an active immunotoxin with low side effects. 4,892,827, Cl. 435-193.000.

Pastor, Jose, to Pitney Bowes Inc. System for conveying information for the reliable authentification of a plurality of documents. 4,893,338, Cl. 380-25.000.

Pastorino, Ronald L.; and Bock, Lawrence A., to Witco Corporation. Dispersions and the preparation of foamed resins therefrom. 4,892,854, Cl. 502-160.000.

Patin, Pierre; and Patin, Pierre-Armand, to Electricite de France Service National. Single or double variable diameter pulley and speed variators including such a double pulley. 4,892,507, Cl. 474-50.000.

Patin, Pierre-Armand: *See*—
Patin, Pierre; and Patin, Pierre-Armand, 4,892,507, Cl. 474-50.000.

Patterson, Leonard H. Random number selection apparatus. 4,892,310, Cl. 273-144.00A.

Patton, Victor L. Adapter plate for converting a three phase meter socket for use with a single phase watt hour meter. 4,892,485, Cl. 439-167.000.

Paul, Ana: *See*—
Paul, Marius A.; Paul, Ana; and Rotkoski, Cristiana J., 4,892,067, Cl. 123-90.120.

Paul, Marius A.; Paul, Ana; and Rotkoski, Cristiana J. Valve control system for engines. 4,892,067, Cl. 123-90.120.

Paulini, Dieter: *See*—
Landen, Peter; Paulini, Dieter; and Wagner, Wolfram, 4,891,873, Cl. 28-255.000.

Paulson, Douglas A. Skimming apparatus and method. 4,892,666, Cl. 210-776.000.

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Pautz, Brigitte: *See*—
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Pavlovec, Radko: *See*—
Svoboda, Josef; and Pavlovec, Radko, 4,892,326, Cl. 280-618.000.

Pawlak, Jan W., to Biogenex Laboratories. Stable phosphatase substrate composition. 4,892,817, Cl. 435-21.000.

Paxman, David H.: *See*—
Fisher, Carole A.; and Paxman, David H., 4,892,838, Cl. 437-41.000.

Payne, John D.: *See*—
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Governale, Bernard C., 4,891,921, Cl. 52-207.000.

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Pellicciari, Roberto: *See*—
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Penven, Patrick H., to Asten Group, Inc. Base fabric structures for seamed wet press felts. 4,892,781, Cl. 428-234.000.

Perdelwitz, Lee E., Jr.; Gaddis, Paul G.; Iff, Ron H.; Cotie, Michael E.; and Neogi, Amar N., to Weyerhaeuser Company. Fire resistant thermoplastic material containing absorbent article. 4,892,769, Cl. 428-68.000.

Peretti, Claudio; and Rebuffatti, Guglielmo, to A.R.I.S.S.p.A. Propulsion, monitoring and control unit particularly for ballistic objects. 4,892,268, Cl. 244-3.100.

Periot, Jean M.: *See*—
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Perkin-Elmer Corporation, The: *See*—
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Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,892,753, Cl. 427-38.000.

Pernick, Benjamin J.; and Nowak, Michael A., to Grumman Aerospace Corporation. Reference input patterns for evaluation and alignment of an optical matched filter correlator. 4,892,408, Cl. 356-400.000.

Pernyeszi, Joseph. Apparatus for improving the efficiency of a lighting element. 4,893,063, Cl. 315-307.000.

Perrier Group of America, Inc., The: *See*—
Cullis, Michael D., 4,892,207, Cl. 215-100.00A.

Perrin, Alain, to Cartier International B.V. Refill bottle. 4,892,206, Cl. 215-12.100.

Perrotta, Anthony J.; Grubbs, Donald K.; Quayle, William H.; and Gurganus, Thomas B., to Aluminum Company of America. Method of making filament growth composite. 4,892,693, Cl. 264-108.000.

Persson-Reeves, Caroline H.: *See*—
Wayland, J. Robert; and Persson-Reeves, Caroline H., 4,891,969, Cl. 73-61.10R.

Pesque, Patrick R., to U.S. Philips Corporation. Echo ultrasound system with an improved image sequence rate. 4,893,283, Cl. 367-7.000.

Peter, Siegfried; and Haertel, Georg. Decontaminstion of gases by scrubbing. 4,892,718, Cl. 423-235.000.

Peters, Alan R.: *See*—
Kozyrski, Vincent T.; and Peters, Alan R., 4,892,020, Cl. 83-463.000.

Peters, Carsten H.: *See*—
Clark, Stanley L.; Peters, Carsten H.; and Trommer, Jack R., 4,893,127, Cl. 342-386.000.

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Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Suzuki, Yoshiyuki; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,892,722, Cl. 423-448.000.

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Pfingst, Bryan E.: *See*—
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Pfizer Inc.: *See*—
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Gill, Robert A.; and Sanders, Nigel D., 4,892,590, Cl. 106-214.000.

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Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,892,699, Cl. 264-328.800.

Pham, Dan-Tam: *See*—
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Pham, Phung N.; and Michael, William E., to PPG Industries, Inc. Urethane coating composition. 4,892,906, Cl. 524-730.000.

Philip Torbet: *See*—
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Phillips Petroleum Company: *See*—
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Geibel, Jon F.; Gaughan, Roger G.; and Cliffton, Michael D., 4,892,929, Cl. 528-480.000.
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Liang, Yeon F., 4,892,930, Cl. 528-487.000.

Physio-Control Corporation: *See*—
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Piacentini, Dario, to Salvagnini Transferica S.p.A. System for connecting a bending blade to its corresponding support in a sheet metal panel bending machine. 4,891,965, Cl. 72-481.000.

Pica, Albert P.: *See*—
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Picard, Gerard: *See*—
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Pierce, John N.: *See*—
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Pierce, Paul E.: *See*—
Davidson, George S.; and Pierce, Paul E., 4,893,234, Cl. 364-200.000.

Pierrat, Michel A. Computer controlled universal grinder and method for grinding trochoidal and circular bearing races. 4,891,914, Cl. 51-105.00R.

Pieterse, Hermanus: *See*—
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Pietzsch, Kurt E., to Dorr-Oliver Incorporated. Vacuum filter with releasably clamped sealing strip. 4,892,656, Cl. 210-232.000.

Pilch, Claus-Dietrich: *See*—
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Pinczowski, Dorothy. Clothes press hanger. 4,892,238, Cl. 223-92.000.

Pingston, Robert D., to N.A.I. Acoustical Interiors, Inc. Acoustical wall panel. 4,891,920, Cl. 52-145.000.

Pinsonneault, Otto. Denture cleaning device. 4,891,857, Cl. 15-21.00R.

Pioneer Electronic Corporation: *See*—
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Endo, Fumio; Kimura, Toshiyuki; and Aoyagi, Yoshio, 4,893,293, Cl. 369-34.000.
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,893,294, Cl. 369-44.000.
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Pitchford, Terry L.: *See*—
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Pittman, Ernest A.; Dandridge, Edward R.; and Wilson, Robert L., to Chromcraft Furniture Corp. Chair shell. 4,892,356, Cl. 297-457.000.

Pitts, W. Hampton; and Thomas, Ronald G., to Access Corporation. Monitoring and reporting system for remote terminals. 4,893,248, Cl. 364-464.010.

Planar Systems, Inc.: *See*—
Ziuchkovski, Michael J., 4,893,319, Cl. 375-111.000.

Plastofilm Industries, Inc.: *See*—
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Plessey Incorporated: *See*—
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Plessey Overseas Limited: *See*—
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Plough, Inc.: *See*—
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Podobnik, Ivan Z.: *See*—
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Poganitsch, Ernst; and Wolfger, Arno, to U. S. Philips Corp. Dry-shaving apparatus comprising at least one slidable shutter. 4,891,880, Cl. 30-34.050.

Pohl, Ulrich; and Renken, Juergen, to MBB GMBH. Segmentized flap system. 4,892,274, Cl. 244-213.000.

Polaroid Corporation: *See*—
Sorli, Duncan C., 4,893,144, Cl. 354-304.000.

Polaski, Eugene L.: *See*—
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Poly Farm, Inc.: *See*—
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Polycast Technology Corporation: *See*—
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Popp, Klaus: *See*—
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Potash, Richard J.; and Burns, Steven K., to Computer Sports Medicine, Inc. Method for referencing multiple data processors to a common time reference. 4,893,318, Cl. 375-109.000.

Pottier, Daniel; Leclaire, P.emy; and Vulliez, Paul, to 501 Normetex. Sealed transmission device using metal bellows, suitable for quarter-turn valves. 4,892,010, Cl. 74-595.000.

Pottier, Jacques: *See—*
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Potvin, Robert E.; St. Alban, Jonas O.; and Sobodacha, Chester J., to Hoechst Celanese Corporation. Mixed ester O-quinone diazide photosensitizers and process of preparation. 4,892,801, Cl. 430-193.000.

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Poynter, Vernon L.: *See—*
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Poynter, William H., Jr.: *See—*
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PPG Industries, Inc.: *See—*
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Prahl, Gregor M., to IPOS GmbH & Co, KG. Artificial foot for a leg prosthesis. 4,892,553, Cl. 623-55.000.

Prass, Richard L., to Cleveland Clinic Foundation, The. Electrical stimulus probe. 4,892,105, Cl. 128-741.000.

Prazak, Gerald: *See—*
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President and Fellows of Harvard College: *See—*
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Prevention Sciences Incorporated: *See—*
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Prigge, Helene; Rurlander, Robert; Schwab, Michael; Bortner, Hans P.; and Englmuller, Andreas, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for removing n-type impurities from liquid or gaseous substances produced in the gas-phase deposition of silicon. 4,892,568, Cl. 55-73.000.

Prill, Fred W.: *See—*
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Protek AG: *See—*
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Proulx, Denis, to Les Emballages P. Proulx Ltee/P. Proulx Packaging Ltd. Board stacking machine. 4,892,458, Cl. 414-791.600.

Prouty, Richard: *See—*
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Weaver, Max A.; Pruett, Wayne P.; Hilbert, Samuel D.; and Coates, Clarence A., Jr., 4,892,923, Cl. 528-190.000.

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Pujol Y Tarrago S.A.: *See—*
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Purdy, David L.: *See—*
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Quay, Jeffrey R.; and Casey, Jeremiah P., to Air Products and Chemicals, Inc. Process for the preparation of cyclohexanediisocyanate containing polyisocyanate prepolymers and polyurethanes having high temperature performance. 4,892,920, Cl. 528-61.000.

Quayle, William H.: *See—*
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R. and A. Bailey & Company Limited: *See—*
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R.P.M. Industries: *See—*
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Rabin, Arno: *See—*
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Rahman, Mahboob F.; Parikh, Dakshesh D.; Daly, Marita E.; and Wang, Bu-Chin, to Advanced Micro Devices Inc. Storage arrangement having a pair of RAM memories selectively configurable for dual-access and two single-access RAMs. 4,893,279, Cl. 365-230.030.

Rain Bird Sprinkler Mfg. Corp.: *See—*
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Ramp, Floyd. Bioreactor. 4,892,818, Cl. 435-30.000.

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Ranalletta, Joseph V.; and Kanner, Rowland W., to Ryder International Corporation. Retractable finger lancet. 4,892,097, Cl. 606-182.000.

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Johnson, William C., 4,892,514, Cl. 493-413.000.

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Randle, Frederick A., to Plessey Overseas Limited. Alignment of fibre arrays. 4,892,377, Cl. 350-96.200.

Rango, Joseph F. Golf putter with detachable divot mender stored in grip. 4,892,314, Cl. 273-162.00D.

Ranner, Dietrich, to Bombardier-Rotax-Wien Produktions- und Vertriebsgesellschaft m.b.H. Ground-working apparatus with rotary tiller. 4,892,154, Cl. 172-72.000.

Rao, Bhaskara M. L.; Kobasz, William; and Menke, James C., to Alupower, Inc. Bipolar electrode and process for manufacturing same. 4,892,797, Cl. 429-210.000.

Rapaway, Mychail. Security lock and seal for double door or window installations. 4,891,907, Cl. 49-67.000.

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Rauch, Hubert: *See—*
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Reese, H. William. Surgical irrigation apparatus. 4,892,526, Cl. 604-290.000.

Reeves, William G.; Roeder, Robert J.; and Duello, Leonard E., to Kimberly-Clark Corporation. Surface treatment for inhibiting thermal oxidation of polypropylene fabrics. 4,892,784, Cl. 428-288.000.

Regan, Patrick, to Eveready Flood Control. Water backup preventing system and monitoring system therefor. 4,892,440, Cl. 405-36.000.

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Renishaw plc: *See—*
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Reynolds, Leonard D.; and Ayasli, Yalcin, to Hittite Microwave Corporation. Cascaded low pass/high pass filter phase shifter system. 4,893,035, Cl. 307-520.000.

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Robert Bosch Power Tool Corporation: *See—*
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Robertson, David J.; Maginley, Ronald J.; Chapman, Alan S. J.; Thomas, Terence N.; Nizamuddin, Nadir; Williams, John W. J.; Redmond, Alan M.; and Morley, Robert S., to Northern Telecom Limited. Digital key telephone system. 4,893,310, Cl. 370-110.100.

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Robin, Roger; Somme, Jean-Francois; and Bouvot, Jean-Francois, to Valeo. Heating installation comprising a heat generator, intended for an automobile. 4,892,248, Cl. 237-12.30B.

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Robinson, Harry W. Hydrotherapy patient support apparatus. 4,891,849, Cl. 4-575.000.

Robitaille, James M., to Ericson Manufacturing Company. Resettiable ground fault circuit interrupter. 4,893,101, Cl. 335-18.000.

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Saito, Naoki: *See*—
Aoki, Kozo; Ono, Michio; and Saito, Naoki, 4,892,810, Cl. 430-553.000.
Saitou, Satoshi, to Kabushiki Kaisha Toshiba. Radiation detecting circuit including positional error calibrator. 4,893,018, Cl. 250-370.100.
Sajda, Paul: *See*—
Sorensen, Keld; Macri, James N.; Douros, Timothy J.; Sajda, Paul; and Ippolito, Emiddio V., 4,892,405, Cl. 356-243.000.
Sakaguchi, Suguru: *See*—
Matsumoto, Kunio; Oshima, Muneo; and Sakaguchi, Suguru, 4,893,172, Cl. 357-79.000.
Sakai Chemical Industry Co., Ltd.: *See*—
Abe, Kazunobu; and Umaba, Toshikatsu, 4,892,716, Cl. 423-213.700.
Sakai, Katsumi; Chou, Kiyoski; and Endo, Takeshi, to Fuji Kagaku Kogyo Kabushiki Kaisha. Oligopeptidyl-5-fluorouridine compounds and process for preparing the same. 4,892,939, Cl. 536-23.000.

Sakai, Kunikazu: *See*—
Terashima, Shiro; Kimura, Yoshikazu; Ito, Yoshio; Sakai, Kunikazu; and Hiyama, Tamejiro, 4,892,961, Cl. 549-419.000.

Sakakura, Toshiyasu: *See*—
Tanaka, Masato; and Sakakura, Toshiyasu, 4,892,936, Cl. 534-595.000.

Sakamoto, Eiichi: *See*—
Hirabayashi, Shigeto; Sato, Hirokazu; and Sakamoto, Eiichi, 4,892,807, Cl. 430-505.000.

Sakamoto, Nobuyasu: *See*—
Tanida, Osamu; Okuno, Yoshiharu; Yoshida, Katsuhiko; Sakamoto, Nobuyasu; Ishikawa, Hsao; and Kobayashi, Eiichi, 4,892,242, Cl. 225-2.000.

Sakamoto, Shuji: *See*—
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 4,892,924, Cl. 528-196.000.

Sakane, Takeshi: *See*—
Imai, Ko; Sakane, Takeshi; and Nogami, Ikuo, 4,892,823, Cl. 435-138.000.

Sakata, Seiji, to Ricoh Company, Ltd. Multi-copy system for a digital copier. 4,893,194, Cl. 358-443.000.

Sakoda, Ryozo: *See*—
Mutsukado, Motoo; Tanikawa, Keizo; Shikada, Ken-ichi; and Sakoda, Ryozo, 4,892,947, Cl. 514-247.000.

Sakuma, Yuichi: *See*—
Sasaki, Akira; and Sakuma, Yuichi, 4,892,168, Cl. 181-250.000.

Sakurada, Muneo; Kurosawa, Isamu; and Wakabayashi, Shinji, to Diesel Kiki Co., Ltd. Air conditioner for automobiles with hot/refrigeration compartment for stored articles. 4,892,135, Cl. 165-42.000.

Sakuragi, Hiroshi, to Kabushiki Kaisha Toshiba. Data processing apparatus having enlargement/reduction functions capable of setting different magnification in different directions. 4,893,258, Cl. 364-521.000.

Sakurai, Takao; Yokota, Tadahiko; Komatsu, Eri; Mikami, Naoko; Higuchi, Ryoichi; and Takeuchi, Koji, to Ajinomoto Co., Inc. Phenyl pyrimidine compound and liquid crystalline composition. 4,892,676, Cl. 252-299.610.

Salee, Gideon: *See*—
Durairaj, Bojayan; Peterson, Alex P., Jr.; and Salee, Gideon, 4,892,908, Cl. 525-160.000.

Salem, Ronald R.; Thomas, Peter; Zamcheck, Norman; and Steele, Glenn, to New England Deaconess Hospital Corporation; and Mallory Institute of Pathology Foundation. Monoclonal antibody for colorectal carcinoma. 4,892,933, Cl. 530-387.000.

Sales, Milton S.; and Thompson, John R., to Eastman Kodak Company. Collation of multi-page documents. 4,893,153, Cl. 355-325.000.

Sallant, Victorino S.: *See*—
Segura, Antonio T.; and Sallant, Victorino S., 4,892,004, Cl. 74-501.50R.

Salmivaara, Martti: *See*—
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.

Salvagnini Transferica S.p.A.: *See*—
Piacentini, Dario, 4,891,965, Cl. 72-481.000.

Salvi, Francisco J. Oven closures. 4,892,085, Cl. 126-340.000.

Sampson, Roy J.; Kelland, John W.; and Kiff, Frank T., to Imperial Chemical Industries PLC. Transition metal composition. 4,892,852, Cl. 502-107.000.

Samsonite Furniture Company: *See*—
Fend, Fritz M., 4,892,355, Cl. 297-440.000.

Samukawa, Koji: *See*—
Seki, Masaki; and Samukawa, Koji, 4,893,251, Cl. 364-474.290.

Sanada, Masahiko; Hayashi, Yoshio; Ohnuma, Akira; and Ogawa, Shuichiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for storing dry silver salt roll film for rotary type microphotography and rotary type microphotography camera system. 4,893,148, Cl. 355-27.000.

Sanden Corporation: *See*—
Ishii, Yutaka, 4,892,143, Cl. 165-152.000.
Okajima, Yoshiaki, 4,892,196, Cl. 206-523.000.
Takashi, Matsushita; and Fumiaki, Uehara, 4,892,176, Cl. 192-84.00C.

Sanders, Michael J.: *See*—
Leighton, John C.; and Sanders, Michael J., 4,892,898, Cl. 524-3.000.

Sanders, Nigel D.: *See*—
Gill, Robert A.; and Sanders, Nigel D., 4,892,590, Cl. 106-214.000.

Sanderson, Jeffrey A. Variable angle saw guide apparatus. 4,892,021, Cl. 83-468.000.

Sandoz Ltd.: *See*—
Snow, Richard K.; and Ellisor, Milton W., Jr., 4,892,410, Cl. 366-2.000.

Sandoz Pharm. Corp.: *See*—
Sorg, Dieter, 4,892,879, Cl. 514-338.000.

Sankyo Company Limited: *See*—
Tomita, Kazuo; Murakami, Tadashi; Tsuji, Hideakira; Matsumoto, Keigo; and Fujita, Katsuhiro, 4,892,882, Cl. 514-380.000.

Sano, Masafumi: *See*—
Hirai, Yutaka; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, 4,893,154, Cl. 357-4.000.

Sano, Shozo, to Kabushiki Kaisha Kaneda Kikai Seisakusho. Auto reel loader. 4,892,610, Cl. 156-446.000.

Santa Barbara Research Center: *See*—
Tourville, Thomas W., 4,891,998, Cl. 74-48.000.

Santoh, Tsuyoshi: *See*—
Miyazaki, Takeshi; Fukui, Tetsuro; and Santoh, Tsuyoshi, 4,892,606, Cl. 156-275.500.

Santoni S.r.l.: *See*—
Donini, Leone, 4,893,104, Cl. 335-266.000.

Sanyo Electric Co., Ltd.: *See*—
Kawai, Yoshihiko; Koyama, Kazuaki; and Yasuda, Isao, 4,891,878, Cl. 29-603.000.

Sarc, Eileen T.: *See*—
Cronauer, Edward A.; and Sarc, Eileen T., 4,893,093, Cl. 330-295.000.

Sargent, Charles L., to Thetford Corporation. Toilet system with removable holding tank for recreational vehicles. 4,892,349, Cl. 296-156.000.

Sarin, Vinod K.; and D'Angelo, Charles, to GTE Laboratories Incorporated. A1N coated silicon nitride based cutting tools. 4,892,792, Cl. 428-698.000.

Sarrine, Robert J.; Guadagno, Philip A.; and Garsee, Henry A., to Helena Laboratories Corporation. Electrophoresis plate and method of making same. 4,892,639, Cl. 204-299.00R.

Sartorelli, Alan C.; and Shyam, Krishnamurthy, to Yale University. N,N'-bis(sulfonyl)hydrazines having antineoplastic activity. 4,892,887, Cl. 514-601.000.

Sartori, Guido: *See*—
Ho, W. S. Winston; and Sartori, Guido, 4,892,674, Cl. 252-189.000.

Sasabe, Masazumi: *See*—
Shioji, Shobu; Sasabe, Masazumi; Dairoku, Yorimichi; and Fujiwara, Teruaki, 4,892,902, Cl. 524-417.000.

Sasaki, Akira; and Sakuma, Yuichi, to Nissan Motor Co., Ltd. Noise attenuating device. 4,892,168, Cl. 181-250.000.

Sasaki, Isao; Yamamoto, Naoki; and Yanagase, Akira, to Mitsubishi Rayon Co., Ltd. Polyphenylene ether resin composition. 4,892,900, Cl. 524-141.000.

Sasaki, Joji: *See*—
Omura, Sadafumi; Sasaki, Joji; Mikami, Akiko; and Mizoue, Kazutoshi, 4,892,821, Cl. 435-127.000.

Sasaki, Kenji: *See*—
Takagishi, Yasushi; Ogura, Toshihiro; Sasaki, Kenji; and Nagata, Shunji, 4,892,738, Cl. 424-468.000.

Sasaki, Kiyotaka: *See*—
Yamamoto, Noboru; Tsujimura, Masakuni; Sasaki, Kiyotaka; Kato, Kouichi; Tani, Hideji; Ito, Yasuo; Matsui, Takeshi; and Hashimoto, Kenji, 4,892,073, Cl. 123-417.000.

Sasaki, Koushi: *See*—
Wada, Keisuke; Hara, Yoshinori; and Sasaki, Koushi, 4,892,955, Cl. 549-325.000.

Sasaki, Masaomi, to Ricoh Company, Ltd. Stilbene derivatives. 4,892,949, Cl. 546-98.000.

Sasaki, Singo: *See*—
Suenaga, Jun-ichi; Naito, Hisayuki; and Sasaki, Singo, 4,892,926, Cl. 528-305.000.

Sato, Hirokazu: *See*—
Hirabayashi, Shigeto; Sato, Hirokazu; and Sakamoto, Eiichi, 4,892,807, Cl. 430-505.000.

Sato, Katsuyuki: *See*—
Kajigaya, Kazuhiko; and Sato, Katsuyuki, 4,893,277, Cl. 365-203.000.

Sato, Kazuo: *See*—
Yamada, Minoru; Masaki, Akira; Sato, Kazuo; and Harada, Yutaka, 4,893,174, Cl. 357-82.000.

Sato, Koji: *See*—
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, 4,893,140, Cl. 354-149.110.

Sato, Kozo: *See*—
Nakamine, Takeshi; and Sato, Kozo, 4,892,858, Cl. 503-227.000.

Sato, Kunihiro: *See*—
Maeda, Tsutomu; Matsui, Kiyoshi; Kanno, Takayuki; and Sato, Kunihiro, 4,893,105, Cl. 336-84.00M.

Sato, Masaaki: *See*—
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,892,678, Cl. 252-500.000.

Sato, Takateru: *See*—
Tanaka, Kimio; Sato, Takateru; and Shiba, Haruo, 4,892,266, Cl. 242-199.000.

Sato, Teiji: *See*—
Ogawa, Masahide; Sato, Teiji; Takahashi, Masao; and Enomoto, Kazumitsu, 4,892,591, Cl. 106-482.000.

Sato, Yasuji: *See*—
Horiuchi, Takeshi; Sato, Yasuji; and Funato, Yasuo, 4,893,331, Cl. 379-93.000.

Satoh, Atsushi, to Olympic Co. Ltd. Variable speed gearing in rotary electric tool. 4,892,013, Cl. 74-785.000.

Satoh, Hiroshi: *See*—
Iriyama, Masahiro; and Satoh, Hiroshi, 4,892,075, Cl. 123-425.000.

Satoh, Shinichi: *See*—
Arai, Masatoshi; Satoh, Shinichi; and Fujioka, Kazutoshi, 4,892,895, Cl. 522-99.000.

Satomura, Hiroshi: *See*—
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.

Satou, Hiroyuki; and Tsuji, Junichi, to Fuji Photo Film Co., Ltd. Photographic printing apparatus. 4,893,149, Cl. 355-67.000.

Sauer, Hans; and Winsel, August, to Varta Batterie Aktiengesellschaft. Plastic-bound gas diffusion electrode containing a manganese oxide catalyst and process for preparing same. 4,892,637, Cl. 204-291.000.

Sauer, Jude S. Tubular tissue welding device without moving parts. 4,892,098, Cl. 606-18.000.

Sawamoto, Takeyuki; Ishida, Koichi; Tarumi, Niro; and Izumitani, Tetsuro, to Hoya Corporation. Method for making contact lens hydrophilic. 4,892,402, Cl. 351-160.00H.

Sawaragi, Yoshiatsu, to Sumitomo Metal Industries, Ltd. Low Si high-temperature strength steel tube with improved ductility and toughness. 4,892,704, Cl. 420-59.000.

Sayed, Edmond A.: *See*—
Charbonneau, Arthur G.; Hale, Stanley N.; and Sayed, Edmond A., 4,891,975, Cl. 73-168.000.

Scaime: *See*—
Aumard, Jean-Pierre, 4,892,163, Cl. 177-211.000.

Schad, Robert D. Reinforced hull for a water craft. 4,892,055, Cl. 114-357.000.

Schaefer, Alan W. Apparatus and process for applying a cover, to a round hay bale. 4,891,930, Cl. 53-587.000.

Schaldach, Max, to BIOTRONIK Mess- und Therapiegerate GmbH & Co. Ingenieurburo Berlin. Demand pacemaker with physiological control. 4,892,100, Cl. 128-419.0PG.

Scheidecker, Ralph W.; and Suchomel, Robert R., to International Business Machines Corporation. Process for controlling ferrous iron content in manganese zinc ferrite. 4,892,672, Cl. 252-62.510.

Scheindel, Christian T. Adapter for use with a lubrication fitting. 4,892,171, Cl. 184-105.300.

Schering Aktiengesellschaft: *See*—
Kruger, Martin; Westermann, Jurgen; Arndt, Friedrich; Rees, Richard; and Hunt, Russel G., 4,892,576, Cl. 71-93.000.
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,892,867, Cl. 514-178.000.

Schering Corporation: *See*—
Leibowitz, Paul J.; and Ryan, Michael J., 4,892,743, Cl. 424-85.700.

Schiel, Lothar: *See*—
Wagner, Wilfried; and Schiel, Lothar, 4,892,027, Cl. 91-369.200.

Schipper, Paul H.: *See*—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,892,643, Cl. 208-70.000.

Schivley, George P., Jr.; and Moore, Calvin J., Jr., to Ingersoll-Rand Company. Drill pipe transfer arm for angle drilling. 4,892,160, Cl. 175-85.000.

Schlenz, Dieter: *See*—
Schneider, Manfred; Heitz, Heinrich; Schlenz, Dieter; and Ewald, Egon, 4,892,605, Cl. 156-272.600.

Schleusener, Annerose: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,892,867, Cl. 514-178.000.

Schloss, Robert P.: *See*—
Carlin, James W.; Chipaloski, Anthony C.; and Schloss, Robert P., 4,893,300, Cl. 370-3.000.

Schluer, Larry: *See*—
Klausing, Thomas A.; and Schluer, Larry, 4,891,955, Cl. 62-295.000.

Schlumberger Industries, Inc.: *See*—
Khalifa, Mohamed; and Manwell, John, 4,891,990, Cl. 73-861.240.

Schlumberger Industries, S.A.: *See*—
De Rego, Andre , 4,891,979, Cl. 73-269.000.

Schlumberger Technology Corporation: *See*—
Masson, Jean P. H. R. M.; Gollwitzer, Lee H.; and Lester, Robert A., 4,893,285, Cl. 367-35.000.

Schmadeke, Friedrichwilhelm: *See*—
Behling, Hans-Jurgen; and Schmadeke, Friedrichwilhelm, 4,892,454, Cl. 414-406.000.

Schmidt, John, to Hougen, Everett D. Torque restraining device for drill with self-attaching base. 4,892,447, Cl. 408-76.000.

Schmidt, Josef; Ducay, James; and Forman, Hugh, to Baxter International Inc. Port assembly for a container. 4,892,222, Cl. 220-356.000.

Schmidt, William P.; Kumar, Ravi; and Abel, Alan D., to Air Products and Chemicals, Inc. Adsorptive separation utilizing multiple adsorption beds. 4,892,565, Cl. 55-26.000.

Schmitz, Franz-Rudolf: *See*—
Stoeckmann, Helmut; Schuette, Klaus; and Schmitz, Franz-Rudolf, 4,892,257, Cl. 241-32.000.

Schmitz, Johannes E. J.; Van Dijk, Antonius J. M.; and Ellwanger, Russell C., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,892,843, Cl. 437-192.000.

Schneider, Edward T.: *See*—
Kralovic, Raymond C.; and Schneider, Edward T., 4,892,706, Cl. 422-28.000.

Schneider, Manfred; Heitz, Heinrich; Schlenz, Dieter; and Ewald, Egon, to Alkor GmbH Kunststoffe. Process for producing a furniture laminate sheet or web. 4,892,605, Cl. 156-272.600.

Schneider, Raymond P.; DuPont, Ronald C., and Dickman, Michael J., to United Technologies Corporation. Aircraft engine interface fairing support. 4,892,254, Cl. 239-265.410.

Schnorr, Peter C.: *See*—
Butts, H. Bruce, Jr.; Cutler, David N.; Schnorr, Peter C.; and Short, Robert T., 4,893,235, Cl. 364-200.000.

Schoebinger, Matthias: *See*—
Mattausch, Hans-Juergen; Matthiesen, Fred; and Schoebinger, Matthias, 4,893,184, Cl. 358-135.000.

Scholz, Matthew T., to Minnesota Mining and Manufacturing Company. Battery. 4,892,794, Cl. 429-72.000.

Schonfeld, Frederick A.: *See*—
Morell, Thomas H.; and Schonfeld, Frederick A., 4,892,014, Cl. 74-866.000.

Schonfeld, Harald, to Carl Schenck AG. Method for determining the position and magnitude of unbalance correction. 4,891,981, Cl. 73-460.000.

Schorling GmbH & Co.: *See*—
Behling, Hans-Jurgen; and Schmadeke, Friedrichwilhelm, 4,892,454, Cl. 414-406.000.

Schrag, Grant M.: *See*—
Colgate, Samuel O.; and Schrag, Grant M., 4,892,321, Cl. 277-167.500.

Schreiber, Wolfgang, to Volkwagen AG. Process for producing a joint between a metallic inner sleeve and a tube of fiber-reinforced plastic material and the resulting joint produced thereby. 4,892,433, Cl. 403-359.000.

Schroeder, Hobe; and James, David E., to Amoco Corporation. Purification of crude terephthalic acid. 4,892,972, Cl. 562-487.000.

Schroff GmbH: *See*—
Bachmann, Peter; and Guenther, Hans U., 4,892,431, Cl. 403-187.000.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See*—
Bahlmann, Bernd; and Walk, Johann, 4,891,863, Cl. 19-80.00R.

Schuette, Klaus: *See*—
Stoeckmann, Helmut; Schuette, Klaus; and Schmitz, Franz-Rudolf, 4,892,257, Cl. 241-32.000.

Schuetz, Jeffrey M.: *See*—
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,892,603, Cl. 156-244.110.

Schulz, Richard H. Subsidiary bench top. 4,892,043, Cl. 108-90.000.

Schulzen, Elisabeth A., heir: *See*—
Schulzen, Herbert W. A., deceased; Schulzen, Elisabeth A., heir; Schulzen, Holger, heir; and Schulzen, Petra S., heir, 4,892,556, Cl. 8-436.000.

Schulzen, Herbert W. A., deceased; Schulzen, Elisabeth A., heir; Schulzen, Holger, heir; and Schulzen, Petra S., heir. Process for transfer printing on leather substrates impregnated with aminoplast pre-condensate. 4,892,556, Cl. 8-436.000.

Schulzen, Holger, heir: *See*—
Schulzen, Herbert W. A., deceased; Schulzen, Elisabeth A., heir; Schulzen, Holger, heir; and Schulzen, Petra S., heir, 4,892,556, Cl. 8-436.000.

Schulzen, Petra S., heir: *See*—
Schulzen, Herbert W. A., deceased; Schulzen, Elisabeth A., heir; Schulzen, Holger, heir; and Schulzen, Petra S., heir, 4,892,556, Cl. 8-436.000.

Schumacher, David B., to Snyder General Corporation. Condensate drain system. 4,892,045, Cl. 110-203.000.

Schuster, Gerhard: *See*—
Fischer, Wolfgang; Hattich, Thomas; Krug, William; and Schuster, Gerhard, 4,892,585, Cl. 106-38.220.

Schutze, Detlef-Ingo; Wunderlich, Klaus; Reinhardt, Karl-Heinz; and Wienkenhover, Martin, to Bayer Aktiengesellschaft. Process for the preparation of naphthalene-1,8-dicarboximides. 4,892,950, Cl. 546-98.000.

Schwab, Michael: *See*—
Prigge, Helene; Rurlander, Robert; Schwab, Michael; Bortner, Hans P.; and Englmuller, Andreas, 4,892,568, Cl. 55-73.000.

Schwartz, Osten, to AB Electrolux. Motor-driven cable reel assembly. 4,893,037, Cl. 310-68.00B.

Schwarz, Richard A.: *See*—
Leatherman, Dennis D.; and Schwarz, Richard A., 4,892,779, Cl. 428-220.000.

Schwarz, Robert A., to Sundstrand Corporation. Hydraulically powered actuator for maintaining a member under preload. 4,891,942, Cl. 60-436.000.

Schweikert, Wilhelm; and Lauer, Wilhelm, to Siemens Aktiengesellschaft. Aluminum electrolyte capacitor. 4,893,217, Cl. 361-506.000.

Schwenk, Gerhard: *See*—
Kaule, Wittich; Moll, Jurgen; Schwenk, Gerhard; and Stenzel, Gerhard, 4,892,336, Cl. 283-91.000.

Schydlo, Martin T. Pump means for swimming pools and similar facilities. 4,892,464, Cl. 417-201.000.

Science Applications International Corporation: *See*—
Eitman, David A., 4,892,755, Cl. 427-203.000.

Scimat Limited: *See*—
Park, George B.; Cook, John A.; and McLoughlin, Robert H., 4,892,559, Cl. 29-623.300.

Scotese, Anthony C.: *See*—
Neuenschwander, Kent W.; and Scotese, Anthony C., 4,892,884, Cl. 514-460.000.

Scott Bader Company Limited: *See*—
Norwood, Lealie S., 4,892,601, Cl. 156-94.000.

Scott, Leonard A., to J. I. Case Company. Shift control system for a hydromechanical tractor transmission. 4,891,999, Cl. 74-337.500.

Scott, Richard E., to Shaw Aero Development Inc. Fuel filler cap with overpressure relief. 4,892,216, Cl. 220-206.000.

Scott, William A.; and Penner, Bernard, to Gehl Company. Straw chopper and spreader assembly. 4,892,504, Cl. 460-112.000.

Scown, Kenneth M. Portable fire detection system. 4,893,324, Cl. 379-40.000.

Screenex Wire Weaving Manufacturers (Proprietary) Limited: *See*—
Freisale, Manfred F. A., 4,892,767, Cl. 428-52.000.

Seagate Technology, Inc.: *See*—
Hoppe, Robert F.; West, Terence H.; and Cheng, Chun-Jer C., 4,893,205, Cl. 360-104.000.

Searles, John E.: *See*—
Griffiths, Ronald S.; and Searles, John E., 4,892,236, Cl. 222-640.000.
Seeger, Michael R.: *See*—
Vrabel, Robert J.; Rhee, Dennis W.; and Seeger, Michael R., 4,893,109, Cl. 340-438.000.
Seely, Warren L.; and Staudinger, Joseph, to Motorola, Inc. 90 Degree broadband MMIC hybrid. 4,893,098, Cl. 333-112.000.
Segawa, Makoto: *See*—
Suzuki, Youichi; Segawa, Makoto; Ariizumi, Shoji; Kondo, Takeo; and Masuoka, Fujio, 4,893,159, Cl. 357-23.130.
Segura, Antonio T.; and Sallant, Victorino S., to Pujol Y Tarrago S.A. Automatic length adjuster for control cables. 4,892,004, Cl. 74-501.50R.
Seidl, Alois: *See*—
Rusch, Helmut; Waitl, Guenter; Harrasser, Hansjoerg; Richter, Hans-Juergen; Francis, Lee; Seidl, Alois; Wissinger, Hans; and Hampel, Hans-Joachim, 4,893,169, Cl. 357-70.000.
Seikosha Co., Ltd.: *See*—
Ishida, Hiroaki; Shinozaki, Nobuo; and Nishitani, Yasuhiro, 4,893,142, Cl. 354-234.100.
Motai, Noboru; Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; Suzuki, Yaeko; Ogiwara, Yoshihisa; Saito, Kazunori; and Shibuki, Keiko, 4,892,613, Cl. 156-643.000.
Seirin Kasei Co., Ltd.: *See*—
Suzuki, Tsuyoshi; and Kudoh, Shoji, 4,892,522, Cl. 604-192.000.
Seki, Masaki; and Samukawa, Koji, to Fanuc Ltd. Method of generating cutting path of complex curved surface. 4,893,251, Cl. 364-474.290.
Sekiden Co., Ltd.: *See*—
Yano, Hiroshi, 4,892,228, Cl. 222-79.000.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See*—
Tanida, Osamu; Okuno, Yoshiharu; Yoshida, Katsuhiko; Sakamoto, Nobuyasu; Ishikawa, Hsao; and Kobayashi, Eiichi, 4,892,242, Cl. 225-2.000.
Senez, Claude: *See*—
Beuzelin, Catherine; and Senez, Claude, 4,892,620, Cl. 162-158.000.
Serbiak, Paul J.; Greenman, Edwin G.; and Shanklin, Gary L., to Kimberly-Clark Corporation. Cleaning product. 4,892,758, Cl. 427-242.000.
Seufert, Frederick B.; and Osterrieth, Pierre J., to Texaco Inc. Control system and method for a synthesis gas process. 4,891,950, Cl. 62-37.000.
SGS Microelettronica S.p.A.: *See*—
Andreini, Antonio; Contiero, Claudio; and Galbiati, Paola, 4,892,836, Cl. 437-29.000.
Motta, Antonino, 4,892,615, Cl. 156-643.000.
Shafer, Harris S.: *See*—
Kure-Jensen, Jens; and Shafer, Harris S., 4,891,948, Cl. 60-645.000.
Shah, Chandrakant S., to Du Pont de Nemours, E. I., and Company. Yarn finish applicator. 4,891,960, Cl. 68-200.000.
Shah, Navnit H., to Hoffmann-La Roche Inc. Controlled release compositions with zero order release. 4,892,742, Cl. 424-480.000.
Shah, Shailesh B.; and Koparkar, Arun D., to Ciba-Geigy Corporation. Osmotic continuous dispensing oral delivery system containing a pharmaceutically acceptable active agent having a improved core membrane adhesion properties. 4,892,739, Cl. 424-473.000.
Shanklin, Gary L.: *See*—
Serbiak, Paul J.; Greenman, Edwin G.; and Shanklin, Gary L., 4,892,758, Cl. 427-242.000.
Sharp Kabushiki Kaisha: *See*—
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, 4,892,390, Cl. 350-335.000.
Ohba, Toshihiro; Kanatani, Yoshiharu; and Uede, Hisashi, 4,893,060, Cl. 315-169.300.
Ohnishi, Souichi; Nakamura, Yasuhide; Komai, Kensaku; and Goto, Kazuyuki, 4,893,236, Cl. 364-405.000.
Yamada, Yoshikado, 4,893,150, Cl. 355-243.000.
Yoshikawa, Masaharu; Sugimoto, Kazuo; Kamitaka, Masuo; Takagi, Shinya; and Yoshida, Hiroyuki, 4,891,952, Cl. 62-199.000.
Shastal, Eugene D. Tamper evident dispensing closure. 4,892,217, Cl. 220-258.000.
Shaw Aero Development Inc.: *See*—
Scott, Richard E., 4,892,216, Cl. 220-206.000.
Shearer, Gerald W.; Lofgren, Karl M. J.; and Ouyang, Kenneth W., to Western Digital Corporation. Biasing circuit for generating precise currents in an integrated circuit. 4,893,030, Cl. 307-296.800.
Sheehan, Patrick G., to Technivac Limited. Pneumatic conveying system. 4,892,123, Cl. 141-7.000.
Sheffield Shipping & Management Ltd.: *See*—
Thomsen, Van E., 4,891,954, Cl. 62-239.000.
Sheinberg, Haskell; Meek, Thomas T.; and Blake, Rodger D., to United States of America, Energy. Dispersion strengthened copper. 4,892,581, Cl. 75-232.000.
Shekleton, Jack R.; and LeCren, Richard T., to Sundstrand Corporation. Turbine combustor with tangential fuel injection and bender jets. 4,891,936, Cl. 60-39.360.
Shell International Research Maatshappij B. V.: *See*—
Itzel, Hanshelmut; Dewenter, Manfred; and Henke, Siegfried, 4,892,866, Cl. 514-119.000.
Shell Oil Company: *See*—
Gerlowski, Leonard E.; and Kastelic, John R., 4,892,697, Cl. 264-234.000.
Himes, Glenn R., 4,892,903, Cl. 524-488.000.
Hoxmeier, Ronald J., 4,892,928, Cl. 525-338.000.
Shen, Chin W., to Texaco, Inc. Alkaline polymer hot water oil recovery process. 4,892,146, Cl. 166-270.000.
Sheng-Huei, Wey. Lens base and its accessories for any compact automatic camera. 4,893,143, Cl. 354-286.000.
Shepherd Products U.S., Inc.: *See*—
Estkowski, Michael H.; Minor, Don E.; and Lastuck, Lennard V., 4,892,354, Cl. 297-301.000.
Sherex Chemical Company, Inc.: *See*—
Keys, Robert O., 4,892,663, Cl. 210-729.000.
Sherwood Medical Company: *See*—
Valerio, Michael A., 4,892,529, Cl. 604-317.000.
Shiba, Haruo: *See*—
Tanaka, Kimio; Sato, Takateru; and Shiba, Haruo, 4,892,266, Cl. 242-199.000.
Shibano, Takeshi: *See*—
Itoh, Kiichi; and Shibano, Takeshi, 4,892,754, Cl. 427-54.100.
Shibata, Eiji: *See*—
Tanabe, Kazunori; Suzuki, Makoto; Makino, Kazumasa; Shibata, Eiji; Ishida, Kazuhito; Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 4,893,147, Cl. 355-27.000.
Shibata, Nobuyuki: *See*—
Shiga, Shoji; Matsuda, Akira; Suda, Hideo; and Shibata, Nobuyuki, 4,892,141, Cl. 165-133.000.
Shibata, Tohru; Namikoshi, Hajime; and Okamoto, Ichiro, to Daicel Chemical Industries, Ltd. Separation agent comprising aliphatic ester of polysaccharide. 4,892,659, Cl. 210-635.000.
Shibuki, Keiko: *See*—
Motai, Noboru; Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; Suzuki, Yaeko; Ogiwara, Yoshihisa; Saito, Kazunori; and Shibuki, Keiko, 4,892,613, Cl. 156-643.000.
Shibuya, Kouji: *See*—
Yamamoto, Junichi; Onuma, Akihiko; Shibuya, Kouji; and Omata, Yasukuni, 4,893,134, Cl. 346-76.0PH.
Shieh, Falin: *See*—
Hassler, William L., Jr.; and Shieh, Falin, 4,892,416, Cl. 384-58.000.
Shiga, Mikio: *See*—
Terasawa, Koji; Yamaguchi, Hideki; Miyakawa, Akira; Matsui, Shinya; Shiga, Mikio; and Tsuyukubo, Shigeru, 4,893,138, Cl. 346-140.00R.
Shiga, Shoji; Matsuda, Akira; Suda, Hideo; and Shibata, Nobuyuki, to Furukawa Electric Co., Ltd., The. Fin of heat exchanger and method of making it. 4,892,141, Cl. 165-133.000.
Shigaki, Takao; Shimazaki, Osamu; and Urabe, Hitoshi, to Fuji Photo Film Co., Ltd. Color image signal processing method. 4,893,180, Cl. 358-80.000.
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, to Idemitsu Kosan Co., Ltd. Polycarbonate containing compound from bis(3-phenyl-4-hydroxyphenyl). 4,892,924, Cl. 528-196.000.
Shigematsu, Nobuo, to Shigematsu Works Co., Ltd. Pressure responsive diaphragm valve. 4,892,094, Cl. 128-201.280.
Shigematsu Works Co., Ltd.: *See*—
Shigematsu, Nobuo, 4,892,094, Cl. 128-201.280.
Shikada, Ken-ichi: *See*—
Mutsukado, Motoo; Tanikawa, Keizo; Shikada, Ken-ichi; and Sakoda, Ryozo, 4,892,947, Cl. 514-247.000.
Shimada, Nobuyoshi: *See*—
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Shimamoto, Mamoru: *See*—
Kozaki, Tetsuji; Shimamoto, Mamoru; and Oonuma, Toshio, 4,892,329, Cl. 280-772.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,892,005, Cl. 74-502.400.
Shimano, Kimihide: *See*—
Takasima, Yasuji; Koyama, Ikuo; Shimano, Kimihide; and Mazuru, Kaoru, 4,892,740, Cl. 424-474.000.
Shimaoka, Kouichi; and Iizuka, Matoi, to Kabushiki Kaisha Toshiba. Data management system for efficiently searching data elements and having a flexible registration order of data elements. 4,893,232, Cl. 364-200.000.
Shimazaki, Osamu: *See*—
Shigaki, Takao; Shimazaki, Osamu; and Urabe, Hitoshi, 4,893,180, Cl. 358-80.000.
Shimbayashi, Kohji: *See*—
Itano, Kiyoshi; and Shimbayashi, Kohji, 4,893,033, Cl. 307-465.000.
Shimizu, Hiroshi; Ozawa, Naohiro; Gotoh, Toshihiko; Hamma, Kentaro; and Nomura, Takeshi, to Hitachi, Ltd. Thermal transfer recording apparatus and ink sheet cassette therefor. 4,892,425, Cl. 400-120.000.
Shimizu, Hisayuki: *See*—
Watanabe, Yoshiharu; Shimizu, Hisayuki; and Ito, Mineo, 4,892,586, Cl. 106-92.000.
Shimizu, Isamu: *See*—
Fujiwara, Ryoji; Yamaguchi, Minori; and Shimizu, Isamu, 4,892,594, Cl. 136-258.000.
Shimizu, Jyousei: *See*—
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, 4,892,423, Cl. 384-611.000.
Shimizu, Seiki: *See*—
Watanabe, Ruyji; Shimizu, Seiki; and Ando, Hisashi, 4,892,986, Cl. 200-144.00B.
Shimizu, Shumpei; Yoshizako, Mamoru; and Cho, Toshitsura, to Tama Chemicals Co., Ltd.; and Moses Lake Industries, Inc. Method for producing high purity chemicals. 4,892,625, Cl. 203-86.000.

Shimomura, Tooru; Naganawa, Kazutomo; Tanamura, Toshiya; and Nagao, Toshiaki, to Omron Tateisi Electronics Co. Physical quantity controller. 4,893,230, Cl. 364-146.000.

Shimpo Kogyo Kabushiki Kaisha: *See*—
Kashihara, Tadashi, 4,892,012, Cl. 74-772.000.

Shimura, Ryoji; and Takahashi, Jun, to Ohi Seisakusho Co., Ltd. Weather strip structure for use with sun roof. 4,891,913, Cl. 49-493.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Arai, Masatoshi; Satoh, Shinichi; and Fujioka, Kazutoshi, 4,892,895, Cl. 522-99.000.

Shinohara, Hirofumi: *See*—
Wada, Tomohisa; and Shinohara, Hirofumi, 4,893,282, Cl. 365-233.500.

Shinozaki, Nobuo: *See*—
Ishida, Hiroaki; Shinozaki, Nobuo; and Nishitani, Yasuhiro, 4,893,142, Cl. 354-234.100.

Shintani, Akira: *See*—
Miyake, Kiyoshi; Shintani, Akira; Suzuki, Keizo; and Miyazaki, Takao, 4,892,751, Cl. 427-34.000.

Shinya, Tadao: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,893,190, Cl. 358-298.000.

Shioji, Shobu; Sasabe, Masazumi; Dairoku, Yorimichi; and Fujiwara, Teruaki, to Nippon Shokubai Kagaku Co., Ltd. Method for production of aqueous dispersion of inorganic pigment. 4,892,902, Cl. 524-417.000.

Shionogi & Co., Ltd.: *See*—
Takagishi, Yasushi; Ogura, Toshihiro; Sasaki, Kenji; and Nagata, Shunji, 4,892,738, Cl. 424-468.000.

Shiozawa, Hideo: *See*—
Hatakoshi, Genichi; Itaya, Kazuhiko; Naritsuka, Shigeya; Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Watanabe, Yukio; Ohba, Yasuo; Kokubun, Yoshihiro; and Uematsu, Yutaka, 4,893,313, Cl. 372-46.000.

Shirai, Katsuo: *See*—
Motai, Noboru; Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; Suzuki, Yaeko; Ogiwara, Yoshihisa; Saito, Kazunori; and Shibuki, Keiko, 4,892,613, Cl. 156-643.000.

Shiraishi, Kazuo: *See*—
Omote, Kiyotaka; Matsushima, Yuichi; Taki, Masami; Oshio, Harutomo; and Shiraishi, Kazuo, 4,892,832, Cl. 435-311.000.

Shirato, Takehide, to Fujitsu Limited. Complementary semiconductor device having high switching speed and latchup-free capability. 4,893,164, Cl. 357-42.000.

Shiseido Company Limited: *See*—
Hamaguchi, Masami; Yanagihara, Hiromu; Hiraoka, Osamu; and Takahashi, Osamu, 4,892,214, Cl. 220-67.000.

Shitara, Kenya: *See*—
Yoshida, Hajime; Hanai, Nobuo; and Shitara, Kenya, 4,892,935, Cl. 530-387.000.

Shoffner, John, to Dura-Line. Prelubricated innerduct. 4,892,442, Cl. 405-154.000.

Short, Robert T.: *See*—
Butts, H. Bruce, Jr.; Cutler, David N.; Schnorr, Peter C.; and Short, Robert T., 4,893,235, Cl. 364-200.000.

Showa Electric Wire & Cable Co., Ltd.: *See*—
Murakami, Takatoshi; Kida, Toshio; Kon, Shiji; Asai, Toshinobu; and Nunome, Yoshiyuki, 4,892,696, Cl. 264-219.000.

Shrawder, Larry. Method and apparatus for automatic corn cob reduction. 4,892,505, Cl. 460-149.000.

Shrewsbury, Junior R. Bar-to-bar armature tester. 4,893,086, Cl. 324-545.000.

Shroot, Braham; Lang, Gerard; and Maignan, Jean, to Centre International de Recherches Dermatologiques (C.I.R.D.). Pharmaceutical and cosmetic compositions containing as an active component 10-acetyl-1,8,9-triacetoxy anthracene. 4,892,864, Cl. 514-510.000.

Shroot, Braham: *See*—
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, 4,892,888, Cl. 514-132.000.
Maignan, Jean; Lang, Gerard; Malle, Gerard; Restle, Serge; and Shroot, Braham, 4,892,940, Cl. 536-55.200.

Shtipelman, Boris A.; and White, David L., to Eastman Kodak Company. Pivoting radial access mechanism with spinning support shaft. 4,893,206, Cl. 360-106.000.

Shuker, Brian; and Huggett, Richard D. J., to Lewmar Marine Limited. Two-speed winch. 4,892,291, Cl. 254-342.000.

Shulan, John L.: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,892,261, Cl. 241-301.000.

Shull, William; Nissen, Rudolf; and Gunther, Kim M., to Spectra-Physics, Inc. Protected internal laser mirror adjusting apparatus. 4,893,314, Cl. 372-107.000.

Shyam, Krishnamurthy: *See*—
Sartorelli, Alan C.; and Shyam, Krishnamurthy, 4,892,887, Cl. 514-601.000.

Sial, Nasir M. Fuels. 4,892,560, Cl. 44-50.000.

Siddiq, Mohammed, to Tandy Corporation. Multifunctional magnetic head cleaning media. 4,893,209, Cl. 360-128.000.

Sidebotham, Christopher G.: *See*—
Zarnowski, Alfred J.; and Sidebotham, Christopher G., 4,892,093, Cl. 606-82.000.

Sie, Swan A., to Chevron Research Company. Sign bit optical geophone. 4,892,373, Cl. 350-96.100.

Siecor Corporation: *See*—
Story, Christopher A.; and Cooper, Susan M., 4,892,382, Cl. 350-96.230.

Siemens AG: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Antonio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, 4,893,309, Cl. 370-110.100.

Siemens Aktiengesellschaft: *See*—
Blossfeldt, Dieter, 4,893,337, Cl. 379-424.000.
Eitner, Dorothea; Kuehnke, Hermann; Messingschlager, Elisabeth; and Wilke, Dorothea, 4,893,321, Cl. 378-121.000.
Knauer, Karl; and Kamp, Winfried, 4,893,269, Cl. 364-784.000.
Kunze, Dieter; and Lancier, Peter, 4,892,443, Cl. 405-164.000.
Mattausch, Hans-Juergen; Matthiesen, Fred; and Schoebinger, Matthias, 4,893,184, Cl. 358-135.000.
Miller, Gerhard; Strack, Helmut; and Tihanyi, Jenoe, 4,893,165, Cl. 357-43.000.
Noll, Tobias; and Meier, Stefan, 4,893,264, Cl. 364-724.100.
Rusch, Helmut; Waitl, Guenter; Harrasser, Hansjoerg; Richter, Hans-Juergen; Francis, Lee; Seidl, Alois; Wissinger, Hans; and Hampel, Hans-Joachim, 4,893,169, Cl. 357-70.000.
Schweikert, Wilhelm; and Lauer, Wilhelm, 4,893,217, Cl. 361-506.000.
Zwack, Eduard, 4,893,097, Cl. 331-176.000.

Sierocuk, Thomas J.; and Dobberstein, Robert J., to General Electric Company. Flexible patient transfer cradle. 4,891,851, Cl. 5-81.00R.

Signode Corporation: *See*—
Cheung, Nelson; Gould, Russell J.; and Enriquez, Manuel C., 4,892,768, Cl. 428-57.000.

Siliconix Incorporated: *See*—
Blanchard, Richard A., 4,893,160, Cl. 357-23.400.
Geekie, James, 4,893,166, Cl. 357-51.000.

Silverberg, Morton, to Pitney Bowes, Inc. Mailing machine. 4,893,249, Cl. 364-464.030.

Silvester, Lenard F.: *See*—
Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., 4,892,796, Cl. 429-196.000.

Simada, Tamotu: *See*—
Watanabe, Kenichi; Simada, Tamotu; Nagai, Keiichi; Tokita, Jirou; Nakano, Ryusei; and Sumitani, Tomoaki, 4,892,638, Cl. 204-299.00R.

Simon, Stephen J.: *See*—
Klainer, Stanley M.; Goswami, Kisholoy; Herron, Nelson R.; Simon, Stephen J.; and Eccles, Lawrence A., 4,892,383, Cl. 350-96.290.

Simonson, Rune; and Ohlsson, Brita. Method for the manufacture of products containing wood chips by insolubilizing the lignin. 4,892,618, Cl. 162-16.000.

Sinclair, Gary A. Portable clipboard and storage box. 4,892,334, Cl. 281-45.000.

Sinco, Inc.: *See*—
Duncan, Charles W., 4,892,169, Cl. 182-138.000.

Siol, Werner; and Terbrack, Ulrich, to Roehm GmbH Chemische Fabrik. Compatible styrene-methacrylate polymer blends. 4,892,909, Cl. 525-216.000.

Skaletsky, Eileen, to Synbiotics Corporation. Fast track method for producing monoclonal bi-specific immunoglobulins. 4,892,824, Cl. 435-172.200.

Skatrud, Paul L.: *See*—
Carr, Lucinda G.; Ingolia, Thomas D.; Queener, Stephen W.; and Skatrud, Paul L., 4,892,819, Cl. 435-69.100.

Skeels, Gary W.; and Ramos, Richard, to UOP. Substituted aluminosilicate compositions and process for preparing same. 4,892,720, Cl. 423-328.000.

SKW Trostberg Aktiengesellschaft: *See*—
Neuer, Bernd, 4,892,580, Cl. 75-53.000.

Slager, David R.: *See*—
Lassiter, Jimmie F., Jr.; and Slager, David R., 4,892,179, Cl. 198-365.000.

Slattery, Carroll A.; and Rodriguez, Carlos Z. Golf ball display stand. 4,892,197, Cl. 211-14.000.

Slavin, Daniel J.; and Kreider, John R., to Dordan Manufacturing Co. Reclosable book-like package. 4,892,195, Cl. 206-473.000.

Sledge, Larry C., to Specialty Packaging Licensing Company. Child-resistant closure assembly. 4,892,208, Cl. 215-216.000.

Sloan-Kettering Institute For Cancer Research: *See*—
Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shunichiro; and Lloyd, Kenneth O., 4,892,828, Cl. 435-240.270.

Slongo, Mario; and Rody, Jean, to Ciba-Geigy Corporation. Copolymers of 2-(2-hydroxy-5-acryloyloxyalkyl)phenyl-2H-benzotriazoles. 4,892,915, Cl. 526-259.000.

Smart, David C., to Eastman Kodak Company. Open frame sight viewfinder. 4,893,141, Cl. 354-219.000.

SMC Corporation: *See*—
Takada, Susumu; and Ishibashi, Kouichirou, 4,892,344, Cl. 294-88.000.

Smedley, William H.: *See*—
Haber, Terry; Foster, Clark B.; and Smedley, William H., 4,892,523, Cl. 604-198.000.

Smetana, Bruce A.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,893,317, Cl. 375-97.000.

Smiecinski, Theodore M.: *See—*
Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., 4,892,893, Cl. 521-128.000.
Smith, Gordon. Intravenous administration system. 4,892,524, Cl. 604-246.000.
Smith, Harry F. Photometric apparatus for multiwell plates having a positionable lens assembly. 4,892,409, Cl. 356-414.000.
Smith, Jack M.: *See—*
Smith, William J.; and Smith, Jack M., 4,893,131, Cl. 343-713.000.
Smith, Mary A. Zegafuse, executrix: *See—*
Dominguez, Ruben, Jr.; Finlay, David E.; Hanna, Stephen D.; Lopez, Jesus C.; Stevenson, David C.; and Zegafuse, Donald W., Jr., deceased, 4,893,257, Cl. 364-519.000.
Smith, Robert E.: *See—*
Cheung, Peter W.; Gauglitz, Karl F.; Mason, Lee R.; Prosser, Stephen J.; Smith, Robert E.; Wagner, Darrell O.; and Hunsaker, Scott W., 4,892,101, Cl. 128-633.000.
Smith, Robert M.: *See—*
Sovis, John F.; Smith, Robert M.; and Bramhall, George H., 4,891,861, Cl. 15-344.000.
Smith, Russell W. Plugging device. 4,892,219, Cl. 220-287.000.
Smith, Stephen: *See—*
Bhagwat, Pradeep; Harrell, Duronie; Smith, Stephen; and Woods, Samuel G., 4,893,067, Cl. 388-817.000.
Smith, William J.; and Smith, Jack M. Mobile or ground mounted arcuate antenna. 4,893,131, Cl. 343-713.000.
Smith, William V., to Lectrolarm Custom Systems, Inc. Video tape recorder control system. 4,893,202, Cl. 360-79.000.
Smiths PLC: *See—*
Jones, John W. D.; and O'Sullivan, Peter F., 4,891,971, Cl. 73-117.300.
Snider, S. Duke; Dohogne, L. Ranney; and Murphy, Patrick K., to Emerson Electric Co. Stator end cap insulator assembly including an improved stator liner, stator liner retainer and shading element insulator. 4,893,041, Cl. 310-215.000.
Snow, Richard K.; and Ellisor, Milton W., Jr., to Sandoz Ltd. Method and apparatus for protective encapsulation of structural members. 4,892,410, Cl. 366-2.000.
Snyder, Gary L., to UMM Holdings, Inc. Jigging spoon. 4,891,900, Cl. 43-42.500.
Snyder General Corporation: *See—*
Schumacher, David B., 4,892,045, Cl. 110-203.000.
Snyder, William J.: *See—*
Farrenkopf, Dennis R.; and Snyder, William J., 4,892,475, Cl. 431-8.000.
Sobodacha, Chester J.: *See—*
Potvin, Robert E.; St. Alban, Jonas O.; and Sobodacha, Chester J., 4,892,801, Cl. 430-193.000.
Societe Anonyme dite: L'OREAL: *See—*
Grollier, Jean-Francois, 4,892,727, Cl. 424-69.000.
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, 4,892,888, Cl. 514-132.000.
Societe Fontaine: *See—*
Lewiner, Jacques; Hennion, Claude; and Leonard, Didier, 4,893,118, Cl. 340-825.540.
Societe Generale Pour Les Techniques Nouvelles S.G.N.: *See—*
Magnin, Guy; Champeaud, Marie-Francoise; Aubert, Veronique; and Jaouen, Claude, 4,892,685, Cl. 252-628.000.
Soichi, Hara; and Kageyama, Hiroshi, to Aisin Seiki Kabushiki Kaisha. Method for manufacturing a piston for an internal combustion engine. 4,891,875, Cl. 29-156.50R.
Solarex Corporation: *See—*
Dickson, Charles R.; Johnson, Barry J.; and Gerhardt, David B., 4,892,592, Cl. 136-244.000.
Solignac, Philippe, to Cegedure Societe de Transformation de l'Aluminum Pechiney. Process for monitoring and regulating the lubrication of the working face of the rotary rolls of a continuous strip casting machine. 4,892,133, Cl. 164-452.000.
Soliz, Julian, III: *See—*
McNeel, William O.; Sackett, James A.; Wood, Joe N.; and Soliz, Julian, III, 4,893,290, Cl. 367-178.000.
Sollac: *See—*
Cordier, Jean; Dussart, Bernard; Petit, Francis; Castanet, Yves; Melloul, Serge; and Mortreux, Andre , 4,892,976, Cl. 568-465.000.
Sollich GmbH & Co. KG: *See—*
Sollich, Helmut, 4,892,033, Cl. 99-455.000.
Sollich, Helmut, to Sollich GmbH & Co. KG. Method and apparatus for continuous processing of substances containing cocoa butter or similar fats. 4,892,033, Cl. 99-455.000.
Solomon, Dennis, to Altman Stage Lighting Co., Inc. Color changer. 4,893,225, Cl. 362-293.000.
Soloway, Richard; and Farrell, Richard. Snap-in modular keypad apparatus. 4,892,981, Cl. 200-5.00A.
Somlo, Tibor: *See—*
Fischer, Walter; and Somlo, Tibor, 4,892,686, Cl. 552-253.000.
Somme, Jean-Francois: *See—*
Robin, Roger; Somme, Jean-Francois; and Bouvot, Jean-Francois, 4,892,248, Cl. 237-12.30B.
Sondergeld, Manfred A.: *See—*
Bauer, Richard D.; Kraska, Ursula A.; and Sondergeld, Manfred A., 4,892,802, Cl. 430-270.000.
Song, Il H., to Videojet Systems International, Inc. Jet ink for vinyl substrate marking. 4,892,775, Cl. 428-195.000.
Songer, Ronald W.; and McInnes, Peter R., to Advanced Cardiovascular Systems, Inc. Steerable perfusion dilatation catheter. 4,892,519, Cl. 604-96.000.
Sony Corporation: *See—*
Matsumoto, Yoshiyuki; Kume, Hidehiro; Mitsumori, Koji; Yoshitoshi, You; Yamamoto, Etsufumi; and Oinoue, Hiroshi, 4,893,296, Cl. 369-112.000.
Nakamura, Shoichi; and Suzuki, Tadao, 4,893,193, Cl. 358-341.000.
Okada, Kentaro, 4,893,199, Cl. 360-48.000.
Sorensen, Keld; Macri, James N.; Douros, Timothy J.; Sajda, Paul; and Ippolito, Emiddio V., to NTD Laboratories, Inc. Method and apparatus for providing quality assurance and calibration assurance in a spectrophotometer. 4,892,405, Cl. 356-243.000.
Sorg, Dieter, to Sandoz Pharm. Corp. 1-substituted-4-(thiazolyl-2-)-piperazines, -piperidines and tetrahydro-pyridines useful as anxiolitic, psychogeriatric, antisepressant and antischiziphrenic agents. 4,892,879, Cl. 514-338.000.
Sorin Biomedica S.p.A.: *See—*
Vallana, Franco, 4,892,540, Cl. 623-2.000.
Sorli, Duncan C., to Polaroid Corporation. Continuous web form instant photographic materials and method for processing the same. 4,893,144, Cl. 354-304.000.
Sorrentino, James V., to Richardson-Vicks Inc. Antitussive liquid compositions containing phenol. 4,892,877, Cl. 514-289.000.
Soshi, Fujio; and Hamu, Tatsuro, to Taikisha Ltd. Electrostatic spray coating method. 4,892,750, Cl. 427-27.000.
Souder, Louis C.: *See—*
Tateosian, Louis H.; and Souder, Louis C., 4,892,478, Cl. 433-6.000.
Southern Research Institute: *See—*
Temple, Carroll G.; and Wheeler, Glynn P., 4,892,874, Cl. 514-249.000.
Southwest Research Institute: *See—*
Lankford, James, Jr., 4,892,849, Cl. 501-97.000.
Sovis, John F.; Smith, Robert M.; and Bramhall, George H., to Royal Appliance Mfg. Co. Hand vacuum cleaner. 4,891,861, Cl. 15-344.000.
Spalding & Evenflo Companies, Inc.: *See—*
Yuan, Arthur H.; and Joss, Michael S., 4,892,517, Cl. 604-74.000.
Spalink, Robert D.; Knowles, Steven M.; and Kusztowny, John T., to Aeroquip Corporation. Refrigeration coupling. 4,892,117, Cl. 137-614.030.
Spargo, John D.; and White, Joseph W., to United States of America, Navy. Elastomeric mount for thrust bearing shoe. 4,892,417, Cl. 384-99.000.
Sparton Corporation: *See—*
Morell, Thomas H.; and Schonfeld, Frederick A., 4,892,014, Cl. 74-866.000.
Spatz, David M., to Chevron Research Company. Substituted heteroaralkyl, heteroaralkenyl or halomethyl fungicides. 4,892,952, Cl. 514-245.000.
Specialty Packaging Licensing Company: *See—*
Sledge, Larry C., 4,892,208, Cl. 215-216.000.
Spectra-Physics, Inc.: *See—*
Shull, William; Nissen, Rudolf; and Gunther, Kim M., 4,893,314, Cl. 372-107.000.
Spectrum 2000, Inc.: *See—*
Fattahi, Farrokh, 4,892,113, Cl. 137-78.300.
Speicher, John M.; and Voigt, Allan A., to Versatron Corporation. Yoke nozzle actuation system. 4,892,253, Cl. 239-265.350.
Speilberger, Richard K.: *See—*
Dunaway, Thomas J.; Speilberger, Richard K.; Loy, Jerald M.; Dicks, Lori A.; and Balgaard, Luverne O., 4,892,245, Cl. 228-180.200.
Spencer, Charles P.; Pitchford, Terry L.; and Radwill, Robert P., to Amsted Industries Incorporated. Fifth wheel mounting pad. 4,892,324, Cl. 280-440.000.
Spinelli, Joseph P., Jr.: *See—*
Weinerman, Lee S.; Spinelli, Joseph P., Jr.; and Rachocki, Michael J., 4,892,338, Cl. 292-35.000.
Spira, Joel S.: *See—*
D'Aleo, Michael J.; and Spira, Joel S., 4,893,062, Cl. 315-291.000.
Spohrer, Thomas S.: *See—*
Hunter, Craig C.; and Spohrer, Thomas S., 4,893,311, Cl. 371-22.500.
Sport Maska Inc.: *See—*
Cournoyer, Andre; Berard, Serge; and Cote, Denis, 4,891,958, Cl. 66-196.000.
Sprague, Barry N.: *See—*
Bowers, Wayne E.; and Sprague, Barry N., 4,892,562, Cl. 44-67.000.
Spurgeon, Robert L. External manual rotatable drive useable to tune a VCR. 4,893,100, Cl. 334-39.000.
SRI International: *See—*
Frese, Karl W., Jr., 4,892,709, Cl. 422-98.000.
SSMC Inc.: *See—*
Jelinek, Vaclav, 4,892,296, Cl. 269-21.000.
Stader, Harald: *See—*
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Antonio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, 4,893,309, Cl. 370-110.100.
Stadler, Hansjorg; and Ruchel, Peter, to Diehl GmbH & Co. Utilization of a material possessing a micro-duplex grain structure. 4,892,991, Cl. 219-121.740.
Stafford, Lawrence R. Well casing cleaning assembly. 4,892,145, Cl. 166-171.000.

Stahlecker, Peter H., to American Suessen Corporation. Support assembly for the rotor of an open end yarn spinning apparatus. 4,892,422, Cl. 384-549.000.

Stahly, G. Patrick, to Ethyl Corporation: Producing bis (alicyclic) thioethers. 4,892,965, Cl. 560-118.000.

Stamatoff, James B.: *See*—
DeMartino, Ronald N.; Yoon, Hyun-Nam; and Stamatoff, James B., 4,892,682, Cl. 252-589.000.

Standard Oil Company: *See*—
Cobb, Wesley N., 4,893,286, Cl. 367-87.000.

Stannow, Jorgen C.; Wolff, Bruno; Gade, Niels H.; Espensen, Ib M.; and Blohm, Knud, to Danfoss A/S. Rotary machine with a measuring device for the angle of rotation. 4,893,007, Cl. 250-231.0SE.

Staudinger, Joseph: *See*—
Seely, Warren L.; and Staudinger, Joseph, 4,893,098, Cl. 333-112.000.

Staudte, Erich: *See*—
Bantien, Jurgen; Bardenhagen, Dietrich; and Staudte, Erich, 4,892,453, Cl. 414-403.000.

STC PLC: *See*—
Blomley, Peter F.; Ayliffe, Peter J.; Huffman, Ewen R. M.; and Yuen, Gregory W. M., 4,893,117, Cl. 340-784.000.

Steegmanns, Manfred: *See*—
Meyer, Hans; and Steegmanns, Manfred, 4,892,463, Cl. 417-151.000.

Steele, David, to Unisys Corporation. Paper movement monitor. 4,892,426, Cl. 400-708.000.

Steele, Glenn: *See*—
Salem, Ronald R.; Thomas, Peter; Zamcheck, Norman; and Steele, Glenn, 4,892,933, Cl. 530-387.000.

Steele, Scott B.: *See*—
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.

Steer, Peter L., to Edward Weck Incorporated. Ostomy coupling. 4,892,530, Cl. 604-338.000.

Stein, Peter. Drinking apparatus. 4,892,187, Cl. 206-217.000.

Steinberger, Ned, to Steinberger Sound Corporation. Tremolo device having an adjustable counterspring and lock. 4,892,025, Cl. 84-313.000.

Steinberger Sound Corporation: *See*—
Steinberger, Ned, 4,892,025, Cl. 84-313.000.

Steinhilber, Helmut. Apparatus for saving and protecting the shoes of the driver of a motor vehicle. 4,892,347, Cl. 296-75.000.

Steinike, Ulrich, to Ernst Jacobi & Co. KG. Device for distributing the air blast in a cleaning device for textile machines. 4,891,860, Cl. 15-312.00A.

Stella, Remo: *See*—
Gallios, George C.; Lien, Charles; Stella, Remo; and Boucher, Wendell, 4,893,227, Cl. 363-26.000.

Stenzel, Gerhard: *See*—
Kaule, Wittich; Moll, Jurgen; Schwenk, Gerhard; and Stenzel, Gerhard, 4,892,336, Cl. 283-91.000.

Steris Corporation: *See*—
Kralovic, Raymond C.; and Schneider, Edward T., 4,892,706, Cl. 422-28.000.

Stern, Morton; and Williams, James, to Motorola, Inc. Colocated cellular radiotelephone systems. 4,893,327, Cl. 379-59.000.

Sternfeld, Hans J.; Wolfmuller, Karlheinz; Froese, Rodhardt; and Paulus, Manfred, to Fr. Kammerer GmbH; and Deutsche Forschungs-und Versuchsaustalt fur luft-und Raumfahrt e.V. Method of producing vapor for use in a vapor sterilizing process. 4,892,705, Cl. 422-26.000.

Steudle, Ernst; Boling, Gerd; and Zillikens, Josef, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for the determination of the concentration of substances dissolved in a solvent by means of osmotic cells. 4,891,968, Cl. 73-64.300.

Steudler, Frederick W., Jr., to Val Products, Inc. Drinking system for poultry, small animals and the like. 4,892,061, Cl. 119-75.000.

Stevens, Robert A.; Boland, Leona G.; and Chiatalas, John L., to Kimberly-Clark Corporation. Method of integrating an absorbent insert into an elastomeric outer cover of a diaper garment. 4,892,598, Cl. 156-91.000.

Stevens, Robert L., to Microscale Organic Laboratory Corporation. Recrystallization apparatus. 4,892,714, Cl. 422-245.000.

Stevenson, David C.: *See*—
Dominguez, Ruben, Jr.; Finlay, David E.; Hanna, Stephen D.; Lopez, Jesus C.; Stevenson, David C.; and Zegafuse, Donald W., Jr., deceased, 4,893,257, Cl. 364-519.000.

Stewart, Lowell J.; and Mebane IV, Alfred H., to Hewlett-Packard Company. Hybrid sample rate servo motor controller. 4,893,066, Cl. 318-600.000.

Stewart, Robert E., to Litton Systems, Inc. Inductively coupled force balance instrument. 4,891,983, Cl. 73-517.00B.

Stewart, Wilber C.; Pica, Albert P.; and Roach, William R., to General Electric Company. Method of arranging the cells within the pixels of a color alpha-numeric display device. 4,892,391, Cl. 350-339.00F.

Steyr-Daimler-Puch AG: *See*—
Aigner, Friedrich, 4,892,026, Cl. 89-140.000.

Sticht, Walter. Method and apparatus for extracting individual parts from a conveyor. 4,892,180, Cl. 198-375.000.

Stiebel, Ariel, to Development/Consulting Associates. Method and apparatus for area and perimeter security with reflection counting. 4,893,005, Cl. 250-221.000.

Stiegeler, Pamela S. Artificial ribboned flower making methods and apparatus. 4,892,515, Cl. 493-956.000.

Stivers, Bernard R., to VBM Corporation. Fluid operated circuit for controlling a dual post hydraulic lift assembly. 4,892,028, Cl. 91-517.000.

Stockton, Gerald W.; Chidester, Dale H.; and Ehrlich, Susan J., to American Cyanamid Company. Apparatus for the calorimetry of chemical processes. 4,892,707, Cl. 422-51.000.

Stockton, Harold E.: *See*—
Stockton, William E.; and Stockton, Harold E., 4,891,987, Cl. 73-732.000.

Stockton, William E.; and Stockton, Harold E. Magnetic linkage for bourdon tube gauges. 4,891,987, Cl. 73-732.000.

Stoeckmann, Helmut; Schuette, Klaus; and Schmitz, Franz-Rudolf, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cone crusher comprising eccentrically driven crushing cone and a means for preventing the entrainment of the crushing cone during no-load operation. 4,892,257, Cl. 241-32.000.

Stol, Isreal, to Aluminum Company of America. Welding system for hollow thin walled members. 4,892,993, Cl. 219-125.100.

Stolz, Thomas O. Plant receptacle. 4,891,905, Cl. 47-66.000.

Story, Christopher A.; and Cooper, Susan M., to Siecor Corporation. Dielectric optical drop cable. 4,892,382, Cl. 350-96.230.

Stowe, Lawrence R.: *See*—
Jennings, Alfred R., Jr.; and Stowe, Lawrence R., 4,892,147, Cl. 166-280.000.

Strack, David C.; Baer, Samuel C.; Cates, Diana M.; and Venkatapathy, Raju, to Kimberly-Clark Corporation. Stitchbonded material including elastomeric nonwoven fibrous web. 4,891,957, Cl. 66-192.000.

Strack, Helmut: *See*—
Miller, Gerhard; Strack, Helmut; and Tihanyi, Jenoe, 4,893,165, Cl. 357-43.000.

Stratton, Kenneth L.; and Bitar, Ali A., to Caterpillar Inc. Velocity reference system. 4,893,287, Cl. 367-91.000.

Strohmaier, Karl G.: *See*—
Leonowicz, Michael E.; Vaughan, David E. W.; and Strohmaier, Karl G., 4,892,721, Cl. 423-328.000.

Strubel, David G., to Brown & Williamson Tobacco Corporation. Simulated smoking article. 4,892,109, Cl. 131-194.000.

Stuart, Keith O.: *See*—
Kurtzman, Zvi; Stuart, Keith O.; and Bartosh, Blake W., 4,892,328, Cl. 280-707.000.

Stumpe, Reinhard: *See*—
Kammerer, Heinz; and Stumpe, Reinhard, 4,893,027, Cl. 307-116.000.

Sturm, Klaus-Dietrich: *See*—
Hellwig, Harry; and Sturm, Klaus-Dietrich, 4,892,201, Cl. 212-186.000.

Su, Kwai-Yung B., to Du Pont de Nemours, E. I., and Company. Fiber reinforced resin sheets. 4,892,772, Cl. 428-113.000.

Su, Wei-Yang: *See*—
Champion, Donald H.; Knifton, John F.; and Su, Wei-Yang, 4,892,959, Cl. 548-579.000.

Suchomel, Robert R.: *See*—
Scheidecker, Ralph W.; and Suchomel, Robert R., 4,892,672, Cl. 252-62.510.

Suda, Hideo: *See*—
Shiga, Shoji; Matsuda, Akira; Suda, Hideo; and Shibata, Nobuyuki, 4,892,141, Cl. 165-133.000.

Suda, Yoshio: *See*—
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,892,678, Cl. 252-500.000.

Suenaga, Jun-ichi; Naito, Hisayuki; and Sasaki, Singo, to Unitika Ltd. Thermotropic liquid crystal polyesters and a method for their production. 4,892,926, Cl. 528-305.000.

Suetterlin, Norbert: *See*—
Klesse, Wolfgang; Rauch, Hubert; Arndt, Peter J.; and Suetterlin, Norbert, 4,892,910, Cl. 525-221.000.

Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, to Canon Kabushiki Kaisha. Photosensitive member having a photoconductive layer comprising a carbonic film for use in electrophotography. 4,892,800, Cl. 430-85.000.

Sugawa, Naoki: *See*—
Tsuji, Kazuhiro; Iida, Tetsuya; and Sugawa, Naoki, 4,893,124, Cl. 341-156.000.

Sugimoto, Kazuo: *See*—
Yoshikawa, Masaharu; Sugimoto, Kazuo; Kamitaka, Masuo; Takagi, Shinya; and Yoshida, Hiroyuki, 4,891,952, Cl. 62-199.000.

Sugimoto, Osamu: *See*—
Inoue, Hisao; Hitomi, Ichiro; Sugimoto, Osamu; and Horita, Teiji, 4,892,419, Cl. 384-322.000.

Sugimoto, Toshio: *See*—
Morino, Seiji; Kawamoto, Satoru; Yoshitani, Yoshihiro; Sugimoto, Toshio; and Nariki, Toshio, 4,892,080, Cl. 123-604.000.

Sugita, Masanori: *See*—
Yasui, Toshihiro; Sugita, Masanori; and Isobe, Tsuneo, 4,892,164, Cl. 180-68.300.
Yasui, Toshihiro; and Sugita, Masanori, 4,892,165, Cl. 180-190.000.

Sullenger, Don R. Scratching device. 4,892,091, Cl. 128-62.00R.

Sullivan, James J.: *See*—
Dixit, Nagaraj S.; Rhinesmith, Robert J.; Sullivan, James J.; Barone, Cynthia A.; Adams, Richard P.; and Lai, Kuo-Yann, 4,892,673, Cl. 252-114.000.

Sullivan, John D., Jr., to United States of America, Army. Dissolved trinitrotoluene in sensitized nitromethane. 4,892,597, Cl. 149-91.000.
Sultan, Myrna C.: *See*—
Tang, Dah-Lain; Chang, Man-Feng; and Sultan, Myrna C., 4,893,244, Cl. 364-431.030.
Sulzer Brothers Limited: *See*—
Hugo, Schilling; Veith, Gunter; and Marcel, Zund. 4,892,119, Cl. 129-1.00R.
Sumal, Jaihind S., to Robert Bosch GmbH. Apparatus for measuring the mass of a flowing medium and method for producing an apparatus for measuring the mass of a flowing medium. 4,891,978, Cl. 73-204.260.
Sumitani, Tomoaki: *See*—
Watanabe, Kenichi; Simada, Tamotu; Nagai, Keiichi; Tokita, Jirou; Nakano, Ryusei; and Sumitani, Tomoaki, 4,892,638, Cl. 204-299.00R.
Sumitomo Electric Industries, Ltd.: *See*—
Ohkawa, Shin-ichi; Tsuno, Koichi; Hiramoto, Jun-ichi; and Matsumiya, Norifumi, 4,892,099, Cl. 606-194.000.
Takata, Koji, 4,892,362, Cl. 303-115.000.
Tsuneishi, Katsuyuki; Ito, Shigeru; and Yamazaki, Takashi, 4,892,572, Cl. 65-10.100.
Sumitomo Heavy Industries, Ltd.: *See*—
Asari, Takashi, 4,892,132, Cl. 164-431.000.
Sumitomo Metal Industries, Ltd.: *See*—
Sawaragi, Yoshiatsu, 4,892,704, Cl. 420-59.000.
Sumitomo Pharmaceuticals Company, Limited: *See*—
Terashima, Shiro; Kimura, Yoshikazu; Ito, Yoshio; Sakai, Kunikazu; and Hiyama, Tamejiro, 4,892,961, Cl. 549-419.000.
Sumitomo Wiring System, Ltd.: *See*—
Tsuchiya, Yoshikazu; Kano, Hideki; Aihara, Yasuyuki; Miyazaki, Noboru; Suzuki, Izumi; and Ichida, Kiyofumi, 4,892,490, Cl. 439-533.000.
Sundstrand Corporation: *See*—
Schwarz, Robert A., 4,891,942, Cl. 60-436.000.
Shekleton, Jack R.; and LeCren, Richard T., 4,891,936, Cl. 60-39.360.
Tysver, John D., 4,892,360, Cl. 303-9.610.
Sundstrand Data Control, Inc.: *See*—
Norling, Brian L., 4,891,982, Cl. 73-497.000.
Sussman, Martin V. Apparatus for incrementally drawing fibers. 4,891,872, Cl. 28-244.000.
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Suzuki, Yoshiyuki; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, to Petoca Ltd. Method for producing high strength, high modulus mesophase-pitch-based carbon fibers. 4,892,722, Cl. 423-448.000.
Suzuki, Izumi: *See*—
Tsuchiya, Yoshikazu; Kano, Hideki; Aihara, Yasuyuki; Miyazaki, Noboru; Suzuki, Izumi; and Ichida, Kiyofumi, 4,892,490, Cl. 439-533.000.
Suzuki, Keizo: *See*—
Miyake, Kiyoshi; Shintani, Akira; Suzuki, Keizo; and Miyazaki, Takao, 4,892,751, Cl. 427-34.000.
Suzuki, Kenji: *See*—
Matama, Toru; Suzuki, Kenji; Takahashi, Koji; and Suzuki, Tsuneo, 4,893,178, Cl. 358-76.000.
Suzuki, Makoto: *See*—
Tanabe, Kazunori; Suzuki, Makoto; Makino, Kazumasa; Shibata, Eiji; Ishida, Kazuhito; Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 4,893,147, Cl. 355-27.000.
Suzuki, Masayuki; and Mochizuki, Noritaka, to Canon Kabushiki Kaisha. Collimating optical system using a spherical lens. 4,892,395, Cl. 350-416.000.
Suzuki, Migaku; Ochi, Mitsuzo; and Kudo, Takeshi, to Uni-Charm Corporation. Disposable diaper. 4,892,528, Cl. 604-385.200.
Suzuki, Saburo; Terada, Takami; and Yamazaki, Masayuki, to Aisin Seiki,Co. Ltd. Seat sliding apparatus for vehicles. 4,892,282, Cl. 248-430.000.
Suzuki, Tadao: *See*—
Nakamura, Shoichi; and Suzuki, Tadao, 4,893,193, Cl. 358-341.000.
Suzuki, Tsuneo: *See*—
Matama, Toru; Suzuki, Kenji; Takahashi, Koji; and Suzuki, Tsuneo, 4,893,178, Cl. 358-76.000.
Suzuki, Tsuyoshi; and Kudoh, Shoji, to Seirin Kasei Co., Ltd. Device for preventing injury when capping injector needle after use. 4,892,522, Cl. 604-192.000.
Suzuki, Yaeko: *See*—
Motai, Noboru; Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; Suzuki, Yaeko; Ogiwara, Yoshihisa; Saito, Kazunori; and Shibuki, Keiko, 4,892,613, Cl. 156-643.000.
Suzuki, Yoshiyuki; Ohtsuka, Tatsumi; Iino, Tadashi; Kasahara, Akihisa; and Tomiyama, Noriyasu, to Yazaki Corporation. On-vehicle head up display device with double images angularly separated less than a monocular resolving power. 4,892,386, Cl. 350-174.000.
Suzuki, Yoshiyuki: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Suzuki, Yoshiyuki; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,892,722, Cl. 423-448.000.
Suzuki, Youichi; Segawa, Makoto; Ariizumi, Shoji; Kondo, Takeo; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Protected MOS transistor circuit. 4,893,159, Cl. 357-23.130.
Svensen, Niels-Alf. Subsurface buoy mooring and transfer system for offshore oil and gas production. 4,892,495, Cl. 441-5.000.
Svoboda, Josef; and Pavlovec, Radko, to TMC Corporation. Non-sole dependent ski binding. 4,892,326, Cl. 280-618.000.
Svyatsky, Eduard, to Bell & Howell Company. Differential document drive. 4,892,300, Cl. 271-225.000.
Sweet, Alan F.: *See*—
Howells, Joseph A.; and Sweet, Alan F., 4,893,197, Cl. 360-8.000.
Sweet, James R., to Exxon Research and Engineering Company. Pressure induced surfactant recovery during ultrafiltration of water-oil emulsions. 4,892,660, Cl. 210-637.000.
Sweetman, Lawrence M.: *See*—
Girodat, Joseph C.; Rumble, David W.; Sweetman, Lawrence M.; and Swindall, William, 4,893,241, Cl. 364-424.070.
Swindall, William: *See*—
Girodat, Joseph C.; Rumble, David W.; Sweetman, Lawrence M.; and Swindall, William, 4,893,241, Cl. 364-424.070.
Swiss Aluminium Ltd.: *See*—
Zuber, Laurent, 4,892,134, Cl. 164-503.000.
Syn-Coat Enterprises: *See*—
Close, Donald S., 4,892,891, Cl. 521-69.000.
Synbiotics Corporation: *See*—
Skaletsky, Eileen, 4,892,824, Cl. 435-172.200.
Synek, Joseph, to Mobay Corporation. Solution of 3-alkylthio-4-amino-6-tert.-butyl-1,2,4-triazin-5-ones in normally liquid n-aryl-n-alkoxyalkyl-haloacetamides. 4,892,577, Cl. 71-93.000.
Synertex: *See*—
Hermann, William J., Jr.; and Zanek, John R., 4,892,525, Cl. 604-263.000.
Szakacs, Geza C. Track unit for use in a vehicle track assembly. 4,892,365, Cl. 305-58.00R.
Szegda, Andrew, to John Mezzalingua Assoc. Inc. Trap bracket assembly. 4,892,275, Cl. 248-61.000.
Szittai, Suzette M.: *See*—
Sager, Annette M.; and Szittai, Suzette M., 4,891,846, Cl. 2-49.00R.
T.D.J. Co., Inc., The: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,892,261, Cl. 241-301.000.
Tabita, Yoshikatsu, to King Chemical Kabushikigaisha. Heating device for electric mosquito killing apparatus. 4,891,904, Cl. 43-112.000.
Tabuchi, Hiroaki: *See*—
Tada, Tetsuya; Tabuchi, Hiroaki; and Teratani, Tatsuo, 4,893,243, Cl. 364-426.040.
Tachibana, Juro; and Nishimura, Yoshihide, to Teijin Seiki Company Limited. Heddle transferring apparatus. 4,891,871, Cl. 28-205.000.
Tachibana, Natsuki; Toshimitsu, Kenshi; and Ichihara, Issey, to Kabushiki Kaisha Toshiba. Paper separating claw for image forming apparatus. 4,893,146, Cl. 355-315.000.
Tada, Kaoru; and Oyabu, Masaaki, to Minolta Camera Kabushiki Kaisha. Apparatus and a method for generating manuscripts to reproduce a color print. 4,893,177, Cl. 358-75.000.
Tada, Kaoru; and Kishi, Masamichi, to Minolta Camera Kabushiki Kaisha. Image processing apparatus capable of eliminating moire pattern. 4,893,195, Cl. 358-454.000.
Tada, Tetsuya; Tabuchi, Hiroaki; and Teratani, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Control device for maintaining constant speed of an automobile. 4,893,243, Cl. 364-426.040.
Tada, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Vortex flowmeter. 4,891,988, Cl. 73-861.220.
Tada, Yoshihiko: *See*—
Nishii, Michiharu; and Tada, Yoshihiko, 4,892,361, Cl. 303-114.000.
Tadashi Arai: *See*—
Arai, Tadashi; Tanaka, Mamoru; and Maeda, Akio, 4,892,731, Cl. 424-93.000.
Taft, Milton C., to Rand McNally & Company. Card construction. 4,892,335, Cl. 283-75.000.
Taguchi, Tatsuhisa; and Abe, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Variable capacity compressor. 4,892,466, Cl. 417-295.000.
Tahara, Tetsuya; Kawakita, Takeshi; Yasumoto, Mitsuyoshi; and Fukuda, Takemi, to Yoshitomi Pharmaceutical Industries, Ltd. Benzoxazine compounds and pharmaceutical use thereof. 4,892,872, Cl. 514-230.500.
Taikisha Ltd.: *See*—
Soshi, Fujio; and Hamu, Tatsuro, 4,892,750, Cl. 427-27.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Omura, Sadafumi; Sasaki, Joji; Mikami, Akiko; and Mizoue, Kazutoshi, 4,892,821, Cl. 435-127.000.
Takasima, Yasuji; Koyama, Ikuo; Shimano, Kimihide; and Mazuru, Kaoru, 4,892,740, Cl. 424-474.000.
Takada, Koji, to Takada Laboratories, Inc. Method of nickel-tungsten-silicon carbide composite plating. 4,892,627, Cl. 204-16.000.
Takada, Kunio; and Okuda, Teruaki, to Canon Kabushiki Kaisha. Process for producing substrate for optical disk by annealing substrate with gradient double refraction distribution. 4,892,692, Cl. 264-106.000.
Takada Laboratories, Inc.: *See*—
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Takada, Susumu; and Ishibashi, Kouichirou, to SMC Corporation. Parallel gripper. 4,892,344, Cl. 294-88.000.
Takagi, Shinya: *See*—
Yoshikawa, Masaharu; Sugimoto, Kazuo; Kamitaka, Masuo; Takagi, Shinya; and Yoshida, Hiroyuki, 4,891,952, Cl. 62-199.000.
Takagishi, Yasushi; Ogura, Toshihiro; Sasaki, Kenji; and Nagata, Shunji, to Shionogi & Co., Ltd. Sustained-release granular pharmaceutical preparations. 4,892,738, Cl. 424-468.000.

Takahashi, Hiroaki: *See*—
Takeuchi, Noboru; Goto, Masakazu; Takahashi, Hiroaki; and Kojima, Takeshi, 4,892,387, Cl. 350-319.000.
Takahashi, Jun: *See*—
Shimura, Ryoji; and Takahashi, Jun, 4,891,913, Cl. 49-493.000.
Takahashi, Kimio: *See*—
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Takahashi, Koji: *See*—
Matama, Toru; Suzuki, Kenji; Takahashi, Koji; and Suzuki, Tsuneo, 4,893,178, Cl. 358-76.000.
Takahashi, Masao: *See*—
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Takahashi, Osamu: *See*—
Hamaguchi, Masami; Yanagihara, Hiromu; Hiraoka, Osamu; and Takahashi, Osamu, 4,892,214, Cl. 220-67.000.
Takahashi, Tadao: *See*—
Mizuno, Koichi; Saito, Masahiro; Takahashi, Tadao; and Aizawa, Reize, 4,892,855, Cl. 502-200.000.
Takahashi, Toshinori: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,893,190, Cl. 358-298.000.
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, to Hitachi, Ltd. Rotary actuator and fabrication process therefor. 4,892,423, Cl. 384-611.000.
Takahashi, Yoshikazu; Itoh, Tsuneo; and Takechi, Makoto, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Semiconductor integrated circuit device including bonding pads and fabricating method thereof. 4,893,168, Cl. 357-68.000.
Takahashi, Yukinobu: *See*—
Nishiwaki, Satoru; Takahashi, Yukinobu; Murakami, Kouji; and Fukuda, Norisuke, 4,893,214, Cl. 361-286.000.
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, to Victor Company of Japan, Ltd. Gradation control device for thermal ink-transfer type printing apparatus. 4,893,190, Cl. 358-298.000.
Takano, Toshimasa: *See*—
Yamazaki, Mutsuki; Oshima, Kaoru; and Takano, Toshimasa, 4,893,151, Cl. 355-245.000.
Takao, Hiroyuki: *See*—
Kato, Yoichiro; Takao, Hiroyuki; Koga, Yasuhide; and Takashima, Tsuguro, 4,892,293, Cl. 266-193.000.
Takashi, Matsushita; and Fumiaki, Uehara, to Sanden Corporation. Electromagnetic clutch having high torque transfer. 4,892,176, Cl. 192-84.00C.
Takashima, Tsuguro: *See*—
Kato, Yoichiro; Takao, Hiroyuki; Koga, Yasuhide; and Takashima, Tsuguro, 4,892,293, Cl. 266-193.000.
Takasima, Yasuji; Koyama, Ikuo; Shimano, Kimihide; and Maezuru, Kaoru, to Taisho Pharmaceutical Co., Ltd. Orally administrable pharmaceutical preparation of improved flavoring characteristics. 4,892,740, Cl. 424-474.000.
Takasu, Katsuji: *See*—
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Takasugi, Yasufumi: *See*—
Nakayama, Masatoshi; Takasugi, Yasufumi; and Ueda, Kunihiro, 4,892,789, Cl. 428-336.000.
Takata, Koji, to Sumitomo Electric Industries, Ltd. Antilocking apparatus for vehicle brakes. 4,892,362, Cl. 303-115.000.
Takechi, Makoto: *See*—
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Takeda Chemical Industries, Ltd.: *See*—
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Takeda, Hiromasa: *See*—
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Takeda, Mitsuru; and Mizunuma, Koji, to Amphenol Corporation. Fiber optic connector. 4,892,379, Cl. 350-96.210.
Takekado, Shigeru, to Kabushiki Kaisha Toshiba. Nutation damper for a high-speed spinning body. 4,892,174, Cl. 188-378.000.
Takemura, Shinichi, to Pioneer Electronic Corporation. Video signal drop-out corrector circuit responsive to level of luminance component of the signal. 4,893,192, Cl. 358-336.000.
Takeshima, Kiyoshi; and Murai, Ryukichi, to Yoshida Kogyo K. K. Slide fastener. 4,891,867, Cl. 24-408.000.
Takeshita, Fusayuki: *See*—
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Takeuchi, Akihiko; and Mizuguchi, Masaaki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic keyboard percussion instrument. 4,892,023, Cl. 84-687.000.
Takeuchi, Koji: *See*—
Sakurai, Takao; Yokota, Tadahiko; Komatsu, Eri; Mikami, Naoko; Higuchi, Ryoichi; and Takeuchi, Koji, 4,892,676, Cl. 252-299.610.
Takeuchi, Noboru; Goto, Masakazu; Takahashi, Hiroaki; and Kojima, Takeshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Light controlling sheet. 4,892,387, Cl. 350-319.000.
Takeuchi, Tatsuo: *See*—
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.
Taki, Masami: *See*—
Omote, Kiyotaka; Matsushima, Yuichi; Taki, Masami; Oshio, Harutomo; and Shiraishi, Kazuo, 4,892,832, Cl. 435-311.000.
Talavera, Dino. Portable tool for compressing a fitting on a hose. 4,891,877, Cl. 29-237.000.
Talgam, Yoav: *See*—
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Tama Chemicals Co., Ltd.: *See*—
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Tamagawa Seiki Kabushiki Kaisha: *See*—
Hayashi, Sokichi, 4,891,997, Cl. 74-5.460.
Tamaru, Kiichiro, to Kabushiki Kaisha Toshiba. Stop/restart latch. 4,893,034, Cl. 307-480.000.
Tamba, Shinichi; and Miyake, Hitomi, to Kawasaki Jukogyo Kabushiki Kaisha. Muffler cooling structure for liquid-cooled engine system. 4,891,940, Cl. 60-320.000.
Tami, Kazuya: *See*—
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Tamura, Kaoru: *See*—
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Tanabe, Hideo; and Tsuzurahara, Mamoru, to Hitachi, Ltd. Cathode structure incorporating an impregnated substrate. 4,893,052, Cl. 313-346.00R.
Tanabe, Kazunori; Suzuki, Makoto; Makino, Kazumasa; Shibata, Eiji; Ishida, Kazuhito; Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, to Brother Kogyo Kabushiki Kaisha. Color picture image recording apparatus. 4,893,147, Cl. 355-27.000.
Tanaka, Hideshi; and Miyazaki, Kenichi, to Victor Company of Japan, Ltd. Gradation control device for thermal ink-transfer type printing apparatus. 4,893,191, Cl. 358-298.000.
Tanaka, Hideshi: *See*—
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Tanaka, Masato; and Sakakura, Toshiyasu, to Agency of Industrial Science and Technology. Process for the preparation or α-azo esters. 4,892,936, Cl. 534-595.000.
Tanaka, Sakae: *See*—
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Tanaka, Sumio; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Imamiya, Keniti, to Kabushiki Kaisha Toshiba. High voltage switching circuit in a nonvolatile memory. 4,893,275, Cl. 365-189.090.
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Thiophene derivative polymer and a polymer composition thereof. 4,892,678, Cl. 252-500.000.
Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Rotor for DC motor. 4,893,042, Cl. 310-216.000.
Tanamura, Toshiya: *See*—
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Tandy Corporation: *See*—
Siddiq, Mohammed, 4,893,209, Cl. 360-128.000.
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Tang, Dah-Lain; Chang, Man-Feng; and Sultan, Myrna C., to General Motors Corporation. Predictive spark timing method. 4,893,244, Cl. 364-431.030.
Tani, Hideji: *See*—
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Tanida, Osamu; Okuno, Yoshiharu; Yoshida, Katsuhiko; Sakamoto, Nobuyasu; Ishikawa, Hsao; and Kobayashi, Eiichi, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Method and device for separating trimming losses of products formed from sheet. 4,892,242, Cl. 225-2.000.
Tanikawa, Keizo: *See*—
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Tanski, William J.; Merritt, Sears W.; and Sacks, Robert N., to United Technologies. Quantum-well acoustic charge transport device. 4,893,161, Cl. 357-24.000.

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Sawamoto, Takeyuki; Ishida, Koichi; Tarumi, Niro; and Izumitani, Tetsuro, 4,892,402, Cl. 351-160.00H.

Taruya, Masaaki; and Ookawa, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition monitoring circuit for an ignition system of an internal combustion engine including an erroneous pulse eliminating circuit means. 4,893,085, Cl. 324-378.000.

Tascon Medical Technology Corporation: *See*—
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Tassielli, Ottavio A.: *See*—
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Tateishi, Yosuke, to Aisin Seiki Kabushiki Kaisha. Vacuum responsive multicontact switch. 4,892,985, Cl. 200-83.00N.

Tateosian, Louis H.; and Souder, Louis C., to Dentsply Research & Development Corp. Method of preparing dental appliances. 4,892,478, Cl. 433-6.000.

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Taylor, Douglas P.; and Lee, David A., to Tayco Developments, Inc. Shock isolation method and apparatus for ship-mounted device. 4,892,051, Cl. 114-1.000.

Taylor, Henry F., to Texas A & M University System. Method for producing reflective taps in optical fibers and applications thereof. 4,892,388, Cl. 350-320.000.

TDK Corporation: *See*—
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Maeda, Tsutomu; Matsui, Kiyoshi; Kanno, Takayuki; and Sato, Kunihiro, 4,893,105, Cl. 336-84.00M.
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Tanaka, Kimio; Sato, Takateru; and Shiba, Haruo, 4,892,266, Cl. 242-199.000.

Teagle, Paul, to British Aerospace Public Limited Company. Apparatus for inspecting articles. 4,891,986, Cl. 73-634.000.

Team Worldwide Corporation: *See*—
Cheng-Chung, Wang, 4,891,855, Cl. 5-449.000.

Technivac Limited: *See*—
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Tecnomare S.p.A.: *See*—
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Teijin Seiki Company Limited: *See*—
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Tejeda, Jose O. V. Automatic electronic and mechanical system to avoid vehicle theft. 4,892,167, Cl. 180-287.000.

Teknekron Infoswitch Corporation: *See*—
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Tektronix, Inc.: *See*—
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Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
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Tellam, Mark: *See*—
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Temple, Carroll G.; and Wheeler, Glynn P., to Southern Research Institute. Synergistic anticancer combination. 4,892,874, Cl. 514-249.000.

Tendick, Donald W., Sr., to Lamplight Farms, Inc. Fragrance dispensing device. 4,892,711, Cl. 422-125.000.

Teng, Clarence W.: *See*—
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Tenghamn, Rune: *See*—
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Tennent, David L.; Fong, Gerald D.; and Hoaglin, Christine L., to Corning Incorporated. Electrically conductive ceramic substrate. 4,892,857, Cl. 502-439.000.

Terada, Takami: *See*—
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Terada, Yoshihiro: *See*—
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Terasawa, Koji; Yamaguchi, Hideki; Miyakawa, Akira; Matsui, Shinya; Shiga, Mikio; and Tsuyukubo, Shigeru, to Canon Kabushiki Kaisha. Ink jet recovery device including a communicating valve and a ventilating valve. 4,893,138, Cl. 346-140.00R.

Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, to Chisso Corporation. Ferroelectric liquid crystal composition. 4,892,393, Cl. 350-350.00S.

Terashima, Shiro; Kimura, Yoshikazu; Ito, Yoshio; Sakai, Kunikazu; and Hiyama, Tamejiro, to Sumitomo Pharmaceuticals Company, Limited. Amino acid derivatives, and their production. 4,892,961, Cl. 549-419.000.

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Terumo Kabushiki Kaisha: *See*—
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Terzuolo, Giancarlo, to Grapho Engineering s.r.l. Continuous damping means for off-set printing machines. 4,892,035, Cl. 101-148.000.

Tesmann, Holger: *See*—
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Texaco Chemical Co.: *See*—
Champion, Donald H.; Knifton, John F.; and Su, Wei-Yang, 4,892,959, Cl. 548-579.000.
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Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft: *See*—
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Theeuwes, Felix; Wong, Patrick S. L.; Cortese, Richard; and Eckenhoff, James B., to ALZA Corporation. Juxtaposed laminated arrangement. 4,892,778, Cl. 428-218.000.

Thetford Corporation: *See*—
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Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie GmbH. Ballast tamping machine. 4,892,040, Cl. 104-6.000.

Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industrie GmbH. Ballast cleaning machine. 4,892,151, Cl. 171-16.000.

Thoman, Owen E. Polymer horseshoe providing enhanced support. 4,892,150, Cl. 168-4.000.

Thomas, David A.; Karr, Robert F.; and Davies, Patricia K., to Adolph Motors COmpany. Heatable mixer apparatus. 4,892,412, Cl. 366-145.000.

Thomas, Gregg. Expanded plastic packaging system for substantially planar objects. 4,892,193, Cl. 206-453.000.

Thomas, Karin U.: *See*—
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Thomas, Peter: *See*—
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Thomas, Stephen B.: *See*—
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Thomas, Terence N.: *See*—
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Thommen, Werner F., to U.S. Philips Corporation. Frequency stabilized oscillator. 4,893,095, Cl. 331-57.000.

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Thompson, Richard T.: *See*—
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Thomsen, Peter N. Cross-cutting apparatus and conveyor for bag filling machines. 4,892,124, Cl. 141-114.000.

Thomsen, Van E., to Sheffield Shipping & Management Ltd. Refrigerated container. 4,891,954, Cl. 62-239.000.

Thornhill, Maria T. Grasping system for use with a contoured sheet. 4,891,856, Cl. 5-496.000.

Thurston, David L.: *See*—
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Thurston, Marlin O.: *See*—
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Tielrooy, Robert W.: *See*—
vander Griendt, Pieter S.; Tielrooy, Robert W.; and Russell, Edward J., 4,892,184, Cl. 198-476.100.

Tigelaar, Howard L.: *See*—
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Tihanyi, Jenoe: *See*—
Miller, Gerhard; Strack, Helmut; and Tihanyi, Jenoe, 4,893,165, Cl. 357-43.000.

Tillman nee Caruso, Nancy J.; and Nalepa, Philip J., to North American Philips Corp. High intensity discharge lamp and electodes for such a lamp. 4,893,057, Cl. 313-631.000.

Ting, Sai-Pei, to General Electric Company. Glass-reinforced blends of polyphenylene ether resin and polyolefin having improved heat distortion temperature. 4,892,904, Cl. 524-494.000.

Tinley, Raymond K., to Cooper Industries. Emergency lighting fixture. 4,893,224, Cl. 362-287.000.

Tire Inflation Systems Corp.: *See*—
Bartos, Josef A., 4,892,128, Cl. 152-417.000.

Tistad, Goran, to Kamyr AB. Method of production of fiber containing pulp with different raw materials. 4,892,619, Cl. 162-49.000.

Tjellstrom, Anders: *See*—
Miller, Josef M.; Pfingst, Bryan E.; Tjellstrom, Anders; and Albrektsson, Tomas, 4,892,108, Cl. 128-784.000.

TMC Corporation: *See*—
Svoboda, Josef; and Pavlovec, Radko, 4,892,326, Cl. 280-618.000.

Tobis, Mark A. Wire support rack for disposable plastic trash bags. 4,892,277, Cl. 248-101.000.

Tocci, Mario P.: *See*—
Bainbridge, David W.; and Tocci, Mario P., 4,892,695, Cl. 264-119.000.

"Toge-Dubel" A. Gerhard Gmbh: *See*—
Gerhard, Anton, 4,892,450, Cl. 411-78.000.

Tokai, Yoichi: *See*—
Kobayashi, Tadahiko; Sahashi, Masashi; and Tokai, Yoichi, 4,891,992, Cl. 73-862.360.

Tokita, Jirou: *See*—
Watanabe, Kenichi; Simada, Tamotu; Nagai, Keiichi; Tokita, Jirou; Nakano, Ryusei; and Sumitani, Tomoaki, 4,892,638, Cl. 204-299.00R.

Tokuda, Takeshi; Korematsu, Jirou; and Tomisawa, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with multilevel wiring in a gate array. 4,893,170, Cl. 357-71.000.

Tokyo Electric Co., Ltd.: *See*—
Unno, Shohei, 4,893,237, Cl. 364-405.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, 4,892,049, Cl. 112-265.200.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Yamanaka, Junichi, 4,893,065, Cl. 315-371.000.

Tomasi, Walter. Device for making it easier to put on articles of clothing. 4,892,239, Cl. 223-111.000.

Tomatsu, Yoshiya, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus. 4,893,010, Cl. 250-318.000.

Tomcufcik, Andrew S.; Wright, William B., Jr.; and Meyer, Walter E., to American Cyanamid Company. Esters of (triarylphosphoranylidene)carbamic acid for effecting diuresis. 4,892,885, Cl. 514-478.000.

Tomelleri, Raffaele, to Garda Impianti S.R.L. Apparatus for measure and/or check the position and orientation of characteristic spots or areas in structures, particularly in motor-vehicle bodies. 4,891,889, Cl. 33-503.000.

Tominaga, Fukutoshi: *See*—
Harada, Kosuke; Katsuki, Akihiko; and Tominaga, Fukutoshi, 4,893,069, Cl. 323-215.000.

Tomisawa, Osamu: *See*—
Tokuda, Takeshi; Korematsu, Jirou; and Tomisawa, Osamu, 4,893,170, Cl. 357-71.000.

Tomita, Kazuo; Murakami, Tadashi; Tsuji, Hideakira; Matsumoto, Keigo; and Fujita, Katsuhiro, to Sankyo Company Limited. Carbamoyloxy-isoxazole derivatives, their preparation and insecticidal compositions containing them. 4,892,882, Cl. 514-380.000.

Tomiyama, Noriyasu: *See*—
Suzuki, Yoshiyuki; Ohtsuka, Tatsumi; Iino, Tadashi; Kasahara, Akihisa; and Tomiyama, Noriyasu, 4,892,386, Cl. 350-174.000.

Tomizawa, Takashi: *See*—
Tanabe, Kazunori; Suzuki, Makoto; Makino, Kazumasa; Shibata, Eiji; Ishida, Kazuhito; Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 4,893,147, Cl. 355-27.000.

Tomlinson, Max S., Jr., to Analog Intelligence Corp. Spike transmission for neural networks. 4,893,255, Cl. 364-513.000.

Tomozawa, Kikuo: *See*—
Yakuwa, Masahiko; Tomozawa, Kikuo; and Kishi, Kazuya, 4,892,077, Cl. 123-487.000.

Tomsicek, Anthony: *See*—
Liska, Miroslav; and Tomsicek, Anthony, 4,892,430, Cl. 403-24.000.

Tonka Corporation: *See*—
Moormann, Randall H., 4,892,081, Cl. 124-65.000.

Toppan Printing Co., Ltd.: *See*—
Omote, Kiyotaka; Matsushima, Yuichi; Taki, Masami; Oshio, Harutomo; and Shiraishi, Kazuo, 4,892,832, Cl. 435-311.000.

Torbet, Philip, to Philip Torbet; and William R. Hebel. Hand holdable automatic bladed appliance for slicing, peeling and the like. 4,891,884, Cl. 30-277.400.

Torrence, Robert J., to Eaton Corporation. Modulated electrically operated refrigerant expansion valve. 4,892,285, Cl. 251-129.050.

Torrington Company, The: *See*—
Christenson, Carl R.; and Alling, Richard L., 4,892,424, Cl. 384-620.000.

Toshiba Silicon Co., Ltd.: *See*—
Yonekura, Kazuya; and Daikuzono, Shoji, 4,892,726, Cl. 424-63.000.

Toshimits, Kazushige; Osawa, Keiichi; Umeda, Tadashi; and Noguchi, Kunio, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control system for internal combustion engines. 4,892,076, Cl. 123-442.000.

Toshimitsu, Kenshi: *See*—
Tachibana, Natsuki; Toshimitsu, Kenshi; and Ichihara, Issey, 4,893,146, Cl. 355-315.000.

Tourville, Thomas W., to Santa Barbara Research Center. Motion conversion apparatus. 4,891,998, Cl. 74-48.000.

Townsend, Leroy B.; Drach, John C.; and Krawczyk, Steven H., to University of Michigan, The Regents of the. Pyrrolo[2,3-d]pyrimidine nucleosides as antiviral agents. 4,892,865, Cl. 514-43.000.

Toy, David Y. K.: *See*—
McLaurin, Leroy D.; and Toy, David Y. K., 4,891,935, Cl. 60-39.370.

Toyoda Gosei Co., Ltd.: *See*—
Kawai, Makoto; Hayashi, Chikahisa; Hirose, Yoshikazu; and Terayama, Tatsuya, 4,891,980, Cl. 73-290.00R.
Nozaki, Masahiro, 4,892,348, Cl. 296-146.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Eto, Kunihiko; Mori, Yutaka; Tanooka, Shigeo; and Kodama, Kazumasa, 4,893,239, Cl. 364-424.050.

Toyomi, Toshitaka: *See*—
Ando, Takumi; Toyomi, Toshitaka; and Osanai, Yasuhiro, 4,892,050, Cl. 112-458.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Tada, Tetsuya; Tabuchi, Hiroaki; and Teratani, Tatsuo, 4,893,243, Cl. 364-426.040.

Tragardh, Jan; Jonsson, Bjarne; and Jensen, Finn, to GN Netcom A/S. Headset having a post auricle mount and arranged to be worn on a person's outer ear. 4,893,344, Cl. 381-187.000.

Traver, Frank J.: *See*—
Lampe, Warren R.; and Traver, Frank J., 4,892,907, Cl. 524-731.000.

Tremblay, Napoleon. Engine oil dip stick indicator wiper. 4,891,859, Cl. 15-210.00B.

Trommer, Jack R.: *See*—
Clark, Stanley L.; Peters, Carsten H.; and Trommer, Jack R., 4,893,127, Cl. 342-386.000.

Truck-Lite Co., Inc.: *See*—
Roller, Philip C., 4,893,111, Cl. 340-471.000.

Trujillo, Rene S.: *See*—
Rogers, John N.; Lady, James M.; Bilsbarrow, Donald W.; and Trujillo, Rene S., 4,893,242, Cl. 364-426.010.

Trunk, Gisela: *See*—
Kerscher, Lorenz; Pautz, Brigitte; Trunk, Gisela; and Ziegenhorn, Joachim, 4,892,815, Cl. 435-7.000.

TRW Inc.: *See*—
Clark, James F.; McFadyen, David J.; and Mishra, Pradeep K., 4,892,984, Cl. 200-61.860.

TRW Technar Inc.: *See*—
Mertes, James L., 4,892,996, Cl. 219-301.000.

Tsai, Tsu-Tzu; and Arnold, Fred E., to United States of America, Air Force. Pendant benzazole rigid-rod aromatic benzoxazole. 4,892,921, Cl. 528-183.000.

Tsamas, Anton. Key ring. 4,891,961, Cl. 70-456.00R.

Tsuchiya, Masaru; Kohno, Junichi; and Okauchi, Ken, to Konica Corporation. Curling prevention device of thermal developing machine. 4,892,994, Cl. 219-216.000.

Tsuchiya, Yoshikazu; Kano, Hideki; Aihara, Yasuyuki; Miyazaki, Noboru; Suzuki, Izumi; and Ichida, Kiyofumi, to Honda Giken Kogyo K.K.; and Sumitomo Wiring System, Ltd. Electrical connector enabling prevention of incomplete coupling. 4,892,490, Cl. 439-533.000.

Tsuda, Hisanori: *See*—
Hirai, Yutaka; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, 4,893,154, Cl. 357-4.000.

Tsudakoma Corp.: *See*—
Sainen, Tsutomu, 4,893,250, Cl. 364-470.000.

Tsuji, Hideakira: *See*—
Tomita, Kazuo; Murakami, Tadashi; Tsuji, Hideakira; Matsumoto, Keigo; and Fujita, Katsuhiro, 4,892,882, Cl. 514-380.000.

Tsuji, Junichi: *See*—
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Tsuji, Kazuhiro; Iida, Tetsuya; and Sugawa, Naoki, to Kabushiki Kaisha Toshiba. Pipelined serial-parallel A/D converter. 4,893,124, Cl. 341-156.000.
Tsujimoto, Shuichi; and Asada, Haruo, to Kabushiki Kaisha Toshiba. Image processing apparatus. 4,893,187, Cl. 358-261.100.
Tsujimura, Masakuni: *See*—
Yamamoto, Noboru; Tsujimura, Masakuni; Sasaki, Kiyotaka; Kato, Kouichi; Tani, Hideji; Ito, Yasuo; Matsui, Takeshi; and Hashimoto, Kenji, 4,892,073, Cl. 123-417.000.
Tsukada, Shigeru: *See*—
Yamada, Kunio; and Tsukada, Shigeru, 4,892,371, Cl. 350-6.800.
Tsuneishi, Katsuyuki; Ito, Shigeru; and Yamazaki, Takashi, to Sumitomo Electric Industries, Ltd. Optical fiber drawing apparatus. 4,892,572, Cl. 65-10.100.
Tsunemitsu, Katsuhiko: *See*—
Mizuno, Kozo; Fujisaki, Hideaki; Uda, Yoshinori; Imai, Tadashi; and Tsunemitsu, Katsuhiko, 4,892,973, Cl. 564-315.000.
Tsuno, Koichi: *See*—
Ohkawa, Shin-ichi; Tsuno, Koichi; Hiramoto, Jun-ichi; and Matsumiya, Norifumi, 4,892,099, Cl. 606-194.000.
Tsuyukubo, Shigeru: *See*—
Terasawa, Koji; Yamaguchi, Hideki; Miyakawa, Akira; Matsui, Shinya; Shiga, Mikio; and Tsuyukubo, Shigeru, 4,893,138, Cl. 346-140.00R.
Tsuzurahara, Mamoru: *See*—
Tanabe, Hideo; and Tsuzurahara, Mamoru, 4,893,052, Cl. 313-346.00R.
Tuckmantel, Hans-Joachim, to Kempchen & Co. GmbH. Stuffing box assembly. 4,892,320, Cl. 277-125.000.
Tung, Thomas T.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,892,699, Cl. 264-328.800.
Turley, Dana F. Intraocular lens providing accomodation. 4,892,543, Cl. 623-6.000.
Turmag Turbo-Maschinen-AG Nussel & Grafer: *See*—
Ebeling, Wolfgang, 4,892,161, Cl. 175-195.000.
Turner, Alan B.; Kondo, Toshiyuki; and Mori, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Dynamo-electric machines. 4,893,040, Cl. 310-156.000.
Turner, William A.: *See*—
McGugan, John D.; Turner, William A.; and Hunt, Robert A. M., 4,892,280, Cl. 248-230.000.
Turney, William J.: *See*—
Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., 4,893,316, Cl. 375-44.000.
Tysver, John D., to Sundstrand Corporation. Brake activation apparatus and power drive unit therefor. 4,892,360, Cl. 303-9.610.
Uarco Incorporated: *See*—
Norman, John A., 4,892,246, Cl. 229-92.800.
Ube Industries, Ltd.: *See*—
Nishihira, Keigo; Yamashita, Masayoshi; and Yoshida, Hiroshi, 4,892,948, Cl. 544-326.000.
Ueno, Toyoaki, 4,892,131, Cl. 164-312.000.
Ucci, Pompelio A.: *See*—
Blyth, Randolph C.; and Ucci, Pompelio A., 4,892,558, Cl. 8-560.000.
Uchida, Shinichi: *See*—
Kawajiri, Tatsuya; Uchida, Shinichi; and Wada, Masahiro, 4,892,856, Cl. 502-247.000.
Uda, Yoshinori: *See*—
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Nakayama, Masatoshi; Takasugi, Yasufumi; and Ueda, Kunihiro, 4,892,789, Cl. 428-336.000.
Uede, Hisashi: *See*—
Ohba, Toshihiro; Kanatani, Yoshiharu; and Uede, Hisashi, 4,893,060, Cl. 315-169.300.
Uematsu, Yutaka: *See*—
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Ueno, Toyoaki, to Ube Industries, Ltd. Injection apparatus of die cast machines. 4,892,131, Cl. 164-312.000.
Ulrich, Gerhard: *See*—
Dilk, Gerhard; Klaiber, Rolf; Kreschel, Kurt; Krieg, Wolfgang; Ruckwied, Heinz; and Ulrich, Gerhard, 4,893,218, Cl. 362-61.000.
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Toshimits, Kazushige; Osawa, Keiichi; Umeda, Tadashi; and Noguchi, Kunio, 4,892,076, Cl. 123-442.000.
Umezu, Kazuhisa; and Ozawa, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Magnetogenerator. 4,892,079, Cl. 123-602.000.
UMM Holdings, Inc.: *See*—
Snyder, Gary L., 4,891,900, Cl. 43-42.500.
Umotoy, Salvador P.: *See*—
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,892,753, Cl. 427-38.000.
Uni-Charm Corporation: *See*—
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Union Carbide Chemical and Plastics Company Inc.: *See*—
Koleske, Joseph V., 4,892,894, Cl. 522-31.000.
Union Carbide Chemicals and Plastics Company Inc.: *See*—
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Union Carbide Corporation: *See*—
Farrenkopf, Dennis R.; and Snyder, William J., 4,892,475, Cl. 431-8.000.
Union Oil Company of California: *See*—
Delaney, Dennis D.; and Gowdy, Hugh W., 4,892,723, Cl. 423-573.100.
Hass, Robert H., 4,892,717, Cl. 423-217.000.
Mendelson, Leah T., 4,892,670, Cl. 252-37.000.
Union Tank Car Company: *See*—
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Unipac, Inc.: *See*—
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Parl, Steen A.; and Pierce, John N., 4,893,128, Cl. 342-379.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,892,921, Cl. 528-183.000.
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Kronenberg, Stanley, 4,893,017, Cl. 250-370.070.
Leupold, Herbert A., 4,893,103, Cl. 335-216.000.
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Cutburth, Ronald W., 4,892,283, Cl. 248-466.000.
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Guilinger, Terry R., 4,892,628, Cl. 204-44.700.
Kustra, Thomas A.; and Caffarel, Alfred J., 4,893,079, Cl. 324-225.000.
Sheinberg, Haskell; Meek, Thomas T.; and Blake, Rodger D., 4,892,581, Cl. 75-232.000.
Health and Human Services: *See*—
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Harrington, Michael G.; Merril, Carl R.; Asher, David M.; and Gajdusek, D. Carleton, 4,892,814, Cl. 435-5.000.
Pastan, Ira H.; Adhya, Sankar; and Fitzgerald, David, 4,892,827, Cl. 435-193.000.
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Spargo, John D.; and White, Joseph W., 4,892,417, Cl. 384-99.000.
U.S. Philips Corporation: *See*—
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Boudewijns, Arnoldus J. J., 4,893,096, Cl. 331-175.000.
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De Lange, Anthonie A., 4,891,879, Cl. 29-822.000.
Evans, David H., 4,893,126, Cl. 342-175.000.
Fisher, Carole A.; and Paxman, David H., 4,892,838, Cl. 437-41.000.
Gentner, Jean-Louis; and Erman, Marko, 4,893,162, Cl. 357-30.000.
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Kuijk, Karel E., 4,892,389, Cl. 350-333.000.
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Luyten, Peter R.; Den Hollander, Jan A.; Den Boef, Johannes H.; and Van Vaals, Johannes J., 4,893,080, Cl. 324-309.000.
Overweg, Johannes A.; and Mens, Wilhelmus R. M., 4,893,083, Cl. 324-318.000.
Pasman, Johannes H. T.; and Van Hijningen, Nicolaas C. J. A., 4,893,298, Cl. 369-275.000.
Pesque, Patrick R., 4,893,283, Cl. 367-7.000.
Poganitsch, Ernst; and Wolfger, Arno, 4,891,880, Cl. 30-34.050.

Rabinzohn, Patrick D.; Rocher, Christian; and Gourrier, Serge, 4,892,835, Cl. 437-22.000.
Schmitz, Johannes E. J.; Van Dijk, Antonius J. M.; and Ellwanger, Russell C., 4,892,843, Cl. 437-192.000.
Thommen, Werner F., 4,893,095, Cl. 331-57.000.
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United Technologies: *See—*
Tanski, William J.; Merritt, Sears W.; and Sacks, Robert N., 4,893,161, Cl. 357-24.000.

United Technologies Corporation: *See—*
Flint, William W., III; and Filipkowski, Richard C., 4,893,261, Cl. 364-565.000.
Rogers, John N.; Lady, James M.; Bilsbarrow, Donald W.; and Trujillo, Rene S., 4,893,242, Cl. 364-426.010.
Schneider, Raymond P.; DuPont, Ronald C.; and Dickman, Michael J., 4,892,254, Cl. 239-265.410.
Waters, James P., 4,892,406, Cl. 356-349.000.

United Technologies Incorporated: *See—*
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Unitika Ltd.: *See—*
Suenaga, Jun-ichi; Naito, Hisayuki; and Sasaki, Singo, 4,892,926, Cl. 528-305.000.

University of British Columbia: *See—*
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University of Florida: *See—*
Bodor, Nicholas S.; and Loftsson, Thorsteinn, 4,892,737, Cl. 424-449.000.

University of Kentucky Research Foundation, The: *See—*
Douglas, Jesse B., Jr., 4,892,483, Cl. 433-229.000.

University of Michigan, The: *See—*
Hays, Paul B., 4,893,003, Cl. 250-216.000.
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University of Waterloo: *See—*
Huang, Robert Y. M., 4,892,661, Cl. 210-640.000.

University of Western Australia, The: *See—*
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Unno, Shohei, to Tokyo Electric Co., Ltd. Interconnected sales data registration and payment settlement system. 4,893,237, Cl. 364-405.000.

UOP: *See—*
Skeels, Gary W.; and Ramos, Richard, 4,892,720, Cl. 423-328.000.

Urabe, Hitoshi: *See—*
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Urbieta, Ignacio, Jr.: *See—*
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Urschel Laboratories Incorporated: *See—*
Fischer, Robert R.; and Fischer, W. James, 4,891,885, Cl. 30-355.000.

Urushiwara, Noriyoshi; Kobayashi, Noboru; and Kobayashi, Ryoichi, to Hitachi, Ltd. Electronic circuit apparatus of automobile. 4,893,215, Cl. 361-395.000.

Usami, Toshiro, to Kabushiki Kaisha Toshiba. Semiconductor memory device for storing image data. 4,893,273, Cl. 365-185.000.

Utsumi, Isao; Kawai, Yasuhiro; Tamura, Kaoru; Machara, Yasunori; Fujiwara, Sigeme; and Koyama, Katsuhide, to Fuji Photo Film Co., Ltd.; and Kabushiki Kaisha Toshiba. Stimulable phosphor sheet stacking tray. 4,892,199, Cl. 211-51.000.

Vac-Tec Systems, Inc.: *See—*
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Val Products, Inc.: *See—*
Steudler, Frederick W., Jr., 4,892,061, Cl. 119-75.000.

Valeo: *See—*
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Naudin, Jacky; and Alas, Jacques, 4,892,008, Cl. 74-574.000.
Robin, Roger; Somme, Jean-Francois; and Bouvot, Jean-Francois, 4,892,248, Cl. 237-12.30B.

Valerio, Michael A., to Sherwood Medical Company. Method of autologous transfusion. 4,892,529, Cl. 604-317.000.

Vallana, Franco, to Sorin Biomedica S.p.A. Two-leaflet prosthetic heart valve. 4,892,540, Cl. 623-2.000.

Vallance, Michael A., to General Electric Company. Interleafed fiber-reinforced thermoplastic composite. 4,892,774, Cl. 428-174.000.

Valmet Oy: *See—*
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.

Valmet Paper Machinery, Inc.: *See—*
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Van Dam Machine Corporation: *See—*
vander Griendt, Pieter S.; Tielrooy, Robert W.; and Russell, Edward J., 4,892,184, Cl. 198-476.100.

Van Cappellen, Jan B.; De Groot, Luc M.; Vancoppenolle, Gery; Vandenbrande, Daniel G.; and De Keyzer, Jan K., to AGFA-Gevaert N.V. Process for making curled photographic film. 4,892,689, Cl. 264-25.000.

Vancoppenolle, Gery: *See—*
Van Cappellen, Jan B.; De Groot, Luc M.; Vancoppenolle, Gery; Vandenbrande, Daniel G.; and De Keyzer, Jan K., 4,892,689, Cl. 264-25.000.

Vandenbrande, Daniel G.: *See—*
Van Cappellen, Jan B.; De Groot, Luc M.; Vancoppenolle, Gery; Vandenbrande, Daniel G.; and De Keyzer, Jan K., 4,892,689, Cl. 264-25.000.

vander Griendt, Pieter S.; Tielrooy, Robert W.; and Russell, Edward J., to Van Dam Machine Corporation. Infeed system for container decorating apparatus. 4,892,184, Cl. 198-476.100.

Van Dijk, Antonius J. M.: *See—*
Schmitz, Johannes E. J.; Van Dijk, Antonius J. M.; and Ellwanger, Russell C., 4,892,843, Cl. 437-192.000.

Van Dyk Burckard, Barney; and Pieterse, Hermanus, to Crucible Societe Anonyme. Letdown valves. 4,892,289, Cl. 251-368.000.

Van Erden, Donald; and Noren, Donald, to Illinois Tool Works Inc. Wrap spring clutch/brake apparatus with helper clutch mechanism. 4,892,175, Cl. 192-12.0BA.

Van Hijningen, Nicolaas C. J. A.: *See—*
Pasman, Johannes H. T.; and Van Hijningen, Nicolaas C. J. A., 4,893,298, Cl. 369-275.000.

Vanier, Noel R., to Eastman Kodak Company. Slipping layer containing amino-modified siloxane and organic lubricating particles for dye-donor element used in thermal dye transfer. 4,892,860, Cl. 503-227.000.

Van Vaals, Johannes J.: *See—*
Luyten, Peter R.; Den Hollander, Jan A.; Den Boef, Johannes H.; and Van Vaals, Johannes J., 4,893,080, Cl. 324-309.000.

van Vuuren, Johannes. Cutting unit for cutting one or more sods. 4,892,152, Cl. 172-20.000.

Varta Batterie Aktiengesellschaft: *See—*
Sauer, Hans; and Winsel, August, 4,892,637, Cl. 204-291.000.

Vats, Raj K. Sound and vibration reducing apparatus. 4,892,413, Cl. 366-349.000.

Vaughan, David E. W.: *See—*
Leonowicz, Michael E.; Vaughan, David E. W.; and Strohmaier, Karl G., 4,892,721, Cl. 423-328.000.

Vaughan, Harry L.: *See—*
Bloom, Walter L.; and Vaughan, Harry L., 4,891,882, Cl. 30-123.300.

VBM Corporation: *See—*
Stivers, Bernard R., 4,892,028, Cl. 91-517.000.

VDO Adolf Schindling AG: *See—*
Blumel, Thomas, 4,893,252, Cl. 364-483.000.

Veaux, Jacques: *See—*
Derrien, Michel; Veaux, Jacques; and Hainaut, Jean-Pierre, 4,892,270, Cl. 244-104.00R.

VEB Schwermaschinenbaukombinat Takraf: *See—*
Hellwig, Harry; and Sturm, Klaus-Dietrich, 4,892,201, Cl. 212-186.000.

Vegh, Bertalan J.; and Pace, Laurel J., to Eastman Kodak Company. Process for stripping color filter arrays from substrates. 4,892,616, Cl. 156-655.000.

Veit GmbH and Co.: *See—*
Veit, Reinhardt, 4,891,894, Cl. 38-66.000.

Veit, Reinhardt, to Veit GmbH and Co. Cover sheet attachment for a tunnel finisher pneumatic roll. 4,891,894, Cl. 38-66.000.

Veith, Gunter: *See—*
Hugo, Schilling; Veith, Gunter; and Marcel, Zund, 4,892,119, Cl. 129-1.00R.

Vella, John, Jr.: *See—*
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,892,699, Cl. 264-328.800.

Venema, Izaak, to U.S. Philips Corporation. Text processing device for stenographic typing. 4,893,238, Cl. 364-419.000.

Venkat, Chaya; and Whitehurst, Darrell D., to Mobil Oil Corporation. Method for treating dewaxing catalysts. 4,892,646, Cl. 208-111.000.

Venkatapathy, Raju: *See—*
Strack, David C.; Baer, Samuel C.; Cates, Diana M.; and Venkatapathy, Raju, 4,891,957, Cl. 66-192.000.

Venus Scientific, Inc.: *See—*
Gallios, George C.; Lien, Charles; Stella, Remo; and Boucher, Wendell, 4,893,227, Cl. 363-26.000.

Versatron Corporation: *See—*
Speicher, John M.; and Voigt, Allan A., 4,892,253, Cl. 239-265.350.

Vestal, David M., Sr., to Vestal Manufacturing Company. Fireplace grate. 4,892,088, Cl. 126-540.000.

Vestal Manufacturing Company: *See—*
Vestal, David M., Sr., 4,892,088, Cl. 126-540.000.

Vianova Kunstharz, A.G.: *See—*
Paar, Willibald, 4,892,913, Cl. 525-452.000.

Vicik, Stephen J.: *See—*
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,892,603, Cl. 156-244.110.

Victor Company of Japan, Ltd.: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,893,190, Cl. 358-298.000.
Tanaka, Hideshi; and Miyazaki, Kenichi, 4,893,191, Cl. 358-298.000.

Video Telecom Corp.: *See—*
Duran, Joe W.; Kenoyer, Michael L.; Cooper, Edward H., Jr.; and Maeng, JoonYoul, 4,893,326, Cl. 379-53.000.

Videojet Systems International, Inc.: *See—*
Song, Il H., 4,892,775, Cl. 428-195.000.

Vieth, Walter: *See—*
Hager, Juergen; and Vieth, Walter, 4,892,260, Cl. 241-282.200.

Vignes, Alain, to Framatome. Light-water nuclear reactor vessel and process for its manufacture. 4,892,702, Cl. 376-294.000.
Viking Systems International, Inc.: *See*—
Kulkarni, Anjol A., 4,892,648, Cl. 209-164.000.
Villa, Francesco, to Harris Blake Corporation. Pulse power linac. 4,893,089, Cl. 328-233.000.
Vincent, Sheridan E.; and Berls, Richard W., to Eastman Kodak Company. Photographic color developing compositions which are especially useful with high chloride photographic elements. 4,892,804, Cl. 430-380.000.
Virta, Raimo: *See*—
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.
Viskase Corporation: *See*—
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,892,603, Cl. 156-244.110.
Vitro Flex, S.A.: *See*—
Cortes, Sergio V., 4,892,574, Cl. 65-273.000.
Vogt, Horst-Dieter. Method and apparatus for determining the average fineness of loose fibres. 4,891,967, Cl. 73-38.000.
Voigt, Allan A.: *See*—
Speicher, John M.; and Voigt, Allan A., 4,892,253, Cl. 239-265.350.
Voigtlander, Volkmar: *See*—
Bauer, Walter; Muller, Jurgen; and Voigtlander, Volkmar, 4,893,011, Cl. 250-327.200.
Volk, Steve J. Propeller breeze enhancing blades for conventional ceiling fans. 4,892,460, Cl. 416-62.000.
Volkwagen AG: *See*—
Schreiber, Wolfgang, 4,892,433, Cl. 403-359.000.
von Benda, Klaus; Benczur-Urmossy, Gabor; Berger, Gerhard; Klink, Rainer; and Gierz, Uwe, to Deutsche Automobilgesellshaft mbH. Nickel-cadmium cell apparatus. 4,892,793, Cl. 429-60.000.
von der Crone, Jost: *See*—
Jaffe, Edward E.; von der Crone, Jost; and Medinger, Bernhard, 4,892,899, Cl. 524-83.000.
Jost, Max; Burdeska, Kurt; and von der Crone, Jost, 4,892,945, Cl. 544-263.000.
von der Heide, Hans. Apparatus for receiving, transporting, chopping, and dispensing blocks of fodder. 4,892,259, Cl. 241-101.700.
Vondruska, Charles. Web glove. 4,892,496, Cl. 441-57.000.
von Zelewski, Andreas; and Kapela, Zenon. Cooling container for butter or the like. 4,892,225, Cl. 220-408.000.
Vrabel, Robert J.; Rhee, Dennis W.; and Seeger, Michael R., to Ford Motor Company. Airbag electrical igniter readiness detector. 4,893,109, Cl. 340-438.000.
Vrana, Edward E.: *See*—
Bansal, Ravinder K.; and Vrana, Edward E., 4,892,566, Cl. 55-26.000.
VTC Incorporated: *See*—
Hester, Richard E.; and Wahl, Jerry R., 4,893,036, Cl. 307-603.000.
Vulliez, Paul: *See*—
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Vuorinen, Vesa: *See*—
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Vyas, Brijesh: *See*—
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W. Schlafhorst & Co.: *See*—
Raasch, Hans, 4,891,933, Cl. 57-269.000.
Wassenhoven, Heinz-Georg, 4,891,974, Cl. 73-160.000.
Wachter, Johann, to Famag Fahrzeug- und Maschinenhandelsgesellschaft m.b.H. Nfg.KG. Roadworking apparatus. 4,891,858, Cl. 15-82.000.
Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See*—
Prigge, Helene; Rurlander, Robert; Schwab, Michael; Bortner, Hans P.; and Englmuller, Andreas, 4,892,568, Cl. 55-73.000.
Wada, Keisuke; Hara, Yoshinori; and Sasaki, Koushi, to Mitsubishi Chemical Industries Limited. Method for producing a lactone. 4,892,955, Cl. 549-325.000.
Wada, Masahiro: *See*—
Kawajiri, Tatsuya; Uchida, Shinichi; and Wada, Masahiro, 4,892,856, Cl. 502-247.000.
Wada, Tomio: *See*—
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, 4,892,390, Cl. 350-335.000.
Wada, Tomohisa; and Shinohara, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device. 4,893,282, Cl. 365-233.500.
Wada, Yukio: *See*—
Kunimune, Noriaki; and Wada, Yukio, 4,892,189, Cl. 206-232.000.
Wagner, Darrell O.: *See*—
Cheung, Peter W.; Gauglitz, Karl F.; Mason, Lee R.; Prosser, Stephen J.; Smith, Robert E.; Wagner, Darrell O.; and Hunsaker, Scott W., 4,892,101, Cl. 128-633.000.
Wagner, Wilfried; and Schiel, Lothar, to Alfred Teves GmbH. Vacuum brake power booster for automotive vehicles and method for its manufacture. 4,892,027, Cl. 91-369.200.
Wagner, Wolfram: *See*—
Landen, Peter; Paulini, Dieter; and Wagner, Wolfram, 4,891,873, Cl. 28-255.000.
Wahl, Jerry R.: *See*—
Hester, Richard E.; and Wahl, Jerry R., 4,893,036, Cl. 307-603.000.
Wai-Kwan, Ho, to Leona Electronics Co., Ltd. Calculator. 4,892,999, Cl. 235-1.00D.
Wai, Thanda: *See*—
Homandberg, Gene A.; and Wai, Thanda, 4,892,826, Cl. 435-183.000.
Waitl, Guenter: *See*—
Rusch, Helmut; Waitl, Guenter; Harrasser, Hansjoerg; Richter, Hans-Juergen; Francis, Lee; Seidl, Alois; Wissinger, Hans; and Hampel, Hans-Joachim, 4,893,169, Cl. 357-70.000.
Wakabayashi, Shinji: *See*—
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Wakai, Toshiyuki; and Kashiwabara, Toshiyuki, to Anritsu Corporation. Optical time domain reflectometer with level adjusting function. 4,893,006, Cl. 250-227.000.
Waki, Kokichi; Hasebe, Kazunori; and Asami, Masahiro, to Fuji Photo Film Co., Ltd. Color image-forming process compressing developer containing no benzyl alcohol. 4,892,803, Cl. 430-380.000.
Wald, Hanns J.; Getrost, Wilfried; and Lang, Sigrid, to Carl Freudenberg, Firma. Fine-grained coated laminate in continuous web form. 4,892,777, Cl. 428-212.000.
Waldrum, John E. Centrifugal applicating device. 4,892,255, Cl. 239-682.000.
Walk, Johann: *See*—
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Walker, James L.: *See*—
Pangrazi, Ronald; and Walker, James L., 4,892,785, Cl. 428-288.000.
Waller, James K., Jr. Extended response dynamic noise reduction system. 4,893,099, Cl. 333-17.100.
Walsh, James W. Membrane processing method. 4,892,662, Cl. 210-649.000.
Walter, John, to Continental Can Company, Inc. Positioning device. 4,892,029, Cl. 92-51.000.
Walter, John, to Continental Can Company, Inc. Control valve assembly. 4,892,115, Cl. 137-269.000.
Walton, Richard R.; and Munchbach, George E., to Walton, Richard R. Device and method for pickup of sheet-form flexible fabric or the like. 4,892,298, Cl. 271-18.300.
Wanamaker, Richard B. Leveling attachment for a skid-steer vehicle. 4,892,155, Cl. 172-199.000.
Wang, Anthony D.: *See*—
Lillis, William J.; and Wang, Anthony D., 4,893,091, Cl. 330-253.000.
Wang, Bu-Chin: *See*—
Rahman, Mahboob F.; Parikh, Dakshesh D.; Daly, Marita E.; and Wang, Bu-Chin, 4,893,279, Cl. 365-230.030.
Wang, Chun S.; Mendoza, Abel; and Fritz, David B., to Dow Chemical Company, The. Process for preparing phenolic hydroxyl-containing compounds from 2,6-dibromo-3,5-dialkyl-4-hydroxybenzyl ethers. 4,892,925, Cl. 528-219.000.
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, to Applied Materials, Inc. Process for PECVD of silicon oxide using TEOS decomposition. 4,892,753, Cl. 427-38.000.
Wang, Tian T. Socket. 4,892,542, Cl. 439-818.000.
Wantanabe, Hiroyuki: *See*—
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Warren, Patrick A.; Auerbach, Robert A.; and Polaski, Eugene L., to Lord Corporation. Flock adhesive composition. 4,892,756, Cl. 427-206.000.
Wassenhoven, Heinz-Georg, to W. Schlafhorst & Co. Method and apparatus for determining characteristics of staple fiber yarns. 4,891,974, Cl. 73-160.000.
Watanabe, Hirokazu, to Yoshida Kogyo K.K. Eye for a hook-and-eye fastener. 4,891,868, Cl. 24-691.000.
Watanabe, Kazuhiro; Saito, Kazuya; Yuchi, Yoshiyuki; and Inagawa, Konosuke, to Nihon Sinku Gijutsu Kabushiki Kaisha. Body coated with cubic boron nitride & method for manufacturing the same. 4,892,791, Cl. 428-698.000.
Watanabe, Keisuke, to Yamaha Corporation. Structure of keyboard used in electronic keyboard instrument. 4,892,024, Cl. 84-719.000.
Watanabe, Kenichi; Simada, Tamotu; Nagai, Keiichi; Tokita, Jirou; Nakano, Ryusei; and Sumitani, Tomoaki, to Hitachi, Ltd. Instrument for determination of the base sequence of DNA. 4,892,638, Cl. 204-299.00R.
Watanabe, Makoto: *See*—
Yamada, Tadaharu; Watanabe, Makoto; and Terada, Yoshihiro, 4,893,204, Cl. 360-103.000.
Watanabe, Ruyji; Shimizu, Seiki; and Ando, Hisashi, to Hitachi, Ltd. Vacuum circuit breaker. 4,892,986, Cl. 200-144.00B.
Watanabe, Toshiyuki: *See*—
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Watanabe, Yoshiaki: *See*—
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Watanabe, Yoshiharu; Shimizu, Hisayuki; and Ito, Mineo, to Denki Kagaku Kogyo Kabushiki Kaisha. Concrete composition for roller compacted placing method. 4,892,586, Cl. 106-92.000.
Watanabe, Yukio: *See*—
Hatakoshi, Genichi; Itaya, Kazuhiko; Naritsuka, Shigeya; Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Watanabe, Yukio;

Ohba, Yasuo; Kokubun, Yoshihiro; and Uematsu, Yutaka, 4,893,313, Cl. 372-46.000.

Watanbe, Fumio: *See*—
Minamisono, Kenichi; Yasunaga, Masayuki; Watanbe, Fumio; and Baba, Noboru, 4,893,350, Cl. 455-278.000.

Waters, James P., to United Technologies Corporation. Method of and arrangement for measuring vibrations. 4,892,406, Cl. 356-349.000.

Waudoit, Claude. Orientation and localization table on map. 4,893,247, Cl. 364-449.000.

Wayland, J. Robert; and Persson-Reeves, Caroline H. Oil/water ratio measurement. 4,891,969, Cl. 73-61.10R.

Weaver, Max A.; Coates, Clarence A., Jr.; Pruett, Wayne P.; and Hilbert, Samuel D., to Eastman Kodak Company. Polyester polymer containing the residue of a benzopyran colorant compound and shaped articles produced therefrom. 4,892,922, Cl. 528-190.000.

Weaver, Max A.; Pruett, Wayne P.; Hilbert, Samuel D.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Polyester compositions containing the residue of a naphthopyran compound and shaped articles produced therefrom. 4,892,923, Cl. 528-190.000.

Webb, Charles A. Combination fishing reel. 4,892,267, Cl. 242-228.000.

Weber, Otto: *See*—
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Webster, Joseph P.; and Gustafson, William L., to Newco Research Corporation. Modularized custom beverage brewer. 4,892,031, Cl. 99-284.000.

Webster, Steven: *See*—
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Webster, William M., Jr.; and Russell, John P., to General Electric Company. Sheet-material authenticated item with reflective-diffractive authenticating device. 4,892,385, Cl. 350-162.230.

Weddige, Ronald C.: *See*—
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.

Wedel, Gregory L., to Beloit Corporation. Dryer section apparatus and method. 4,891,891, Cl. 34-23.000.

Wedeniwski, Horst J., to Fortuna-Werke Maschinenfabrik GmbH. Dressing roll and method for producing the same. 4,892,082, Cl. 125-11.00R.

Weevers, Henri H., to Mokveld Valves B.V. Valve body with a housing having a cylindrical flow passage. 4,892,287, Cl. 251-172.000.

Weigt, George A.: *See*—
Lubarsky, Daniel P.; Weigt, George A.; and Haisch, Mark E., 4,893,340, Cl. 380-50.000.

Weihrauch, Georg, to Coronet-Werke Heinrich Schlerf GmbH. Method for manufacturing products with bristles. 4,892,698, Cl. 264-243.000.

Weinerman, Lee S.; Spinelli, Joseph P., Jr.; and Rachocki, Michael J., to Eastern Company, The. Plural point door lock and flush-mountable operating mechanism with detent. 4,892,338, Cl. 292-35.000.

Weiss, David L.: *See*—
Bright, Michael W.; Ziolko, Eric F.; Wilson, Alan L.; Bray, Michelle M.; Hennen, Harry A.; and Weiss, David L., 4,893,339, Cl. 380-28.000.
Wilson, Alan L.; Bright, Michael W.; Bray, Michelle M.; Ziolko, Eric F.; and Weiss, David L., 4,893,308, Cl. 370-109.000.

Weiss, Ludwig; and Hoffman, Georg-Erich, to Boehringer Mannheim GmbH. Process and a reagent kit for the determination of direct and total filirubin. 4,892,833, Cl. 436-97.000.

Welford, David, to Massachusetts Institute of Technology. Optical transmitter of modulated signals. 4,893,352, Cl. 455-610.000.

Welsch, John H., to InterMetro Industries Corporation. Corner structure for a modular shelf and method of making same. 4,892,044, Cl. 108-154.000.

Weltgen, Paul O.: *See*—
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Welty, Richard P., to Vac-Tec Systems, Inc. Magnetron sputtering cathode. 4,892,633, Cl. 204-192.120.

Wen, Maz. Synergetic speed-variating means as eccentrically operated. 4,892,506, Cl. 474-49.000.

Wescotek, Inc.: *See*—
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West, Christopher: *See*—
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West, Terence H.: *See*—
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Westermann, Jurgen: *See*—
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Western Atlas International, Inc.: *See*—
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Western Digital Corporation: *See*—
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Westinghouse Electric Corp.: *See*—
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Chenoweth, Terrence E.; Hammack, Eugenius S.; and McDonald, Wallace L., 4,892,773, Cl. 428-121.000.
Hall, George V. B.; and Mallory, Charles W., 4,893,022, Cl. 250-506.100.
McLaurin, Leroy D.; and Toy, David Y. K., 4,891,935, Cl. 60-39.370.

Westling, Gregory L.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,893,317, Cl. 375-97.000.

Westvaco Corporation: *See*—
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Dilling, Peter; Loeffler, Vaughn R.; Prazak, Gerald; and Thomas, Karin U., 4,892,588, Cl. 106-123.100.

Wet Enterprises, Inc.: *See*—
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Wettlaufer, Dale E. Method and press for pressing liquid from thin layers of liquid containing masses. 4,892,665, Cl. 210-770.000.

Weyerhaeuser Company: *See*—
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Wezag GmbH: *See*—
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Wheeler, Glynn P.: *See*—
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Wheeler, Roger R.; and Martin, John R., to Martin Automatic, Inc. Knife wheel assembly suitable for forming a butt splice. 4,892,611, Cl. 156-504.000.

Whirlpool Corporation: *See*—
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White Consolidated Industries, Inc.: *See*—
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White, David L.: *See*—
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White, John M.: *See*—
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,892,753, Cl. 427-38.000.

White, Joseph W.: *See*—
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White, Merwin G. Recovery of precious metals from complex ores. 4,892,631, Cl. 204-109.000.

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Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, to Schering Aktiengesellschaft. Antiandrogenic 17-alpha-alkyl steroids. 4,892,867, Cl. 514-178.000.

Wienkenhover, Martin: *See*—
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Wild, Hans J., to Givaudan Corporation. Acetoacetic acid ester derivatives for the manufacture of α-hydroxycarbonyl compounds. 4,892,966, Cl. 560-174.000.

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Willis, Walter C. Garden tool. 4,892,156, Cl. 172-381.000.

Willman - Schwabe GmbH & Co.: *See*—
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Wilson, Alan L.; Bright, Michael W.; Bray, Michelle M.; Ziolko, Eric F.; and Weiss, David L., to Motorola, Inc. Method and apparatus for time companding a digital voice signal. 4,893,308, Cl. 370-109.000.

Wilson, Alan L.: *See*—
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Wogoman, Frank W., to Miles Inc. Fluid separation and processing device. 4,892,708, Cl. 422-72.000.
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Wollner, Erik, deceased (by Wollner, Barbro, representative); Wollner, Barbro; and Ennerdal, Leif, to Allied Engineering Company S.A. Motorized height adjuster for adjusting the height of the pillar loop in vehicle safety belts. 4,892,331, Cl. 280-808.000.
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Yakuwa, Masahiko; Tomozawa, Kikuo; and Kishi, Kazuya, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection control method for internal combustion engines. 4,892,077, Cl. 123-487.000.
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Yamada, Takuma, to Dainippon Screen Mfg. Co., Ltd. Surface treatment method and apparatus therefor. 4,892,761, Cl. 427-430.100.
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Yasui, Toshihiro; and Sugita, Masanori, to Yamaha Hatsudoki Kabushiki Kaisha. Frame construction for small snowmobile. 4,892,165, Cl. 180-190.000.
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Yoshida, Hajime; Hanai, Nobuo; and Shitara, Kenya, to Kyowa Hakko Kogyo Co., Ltd. Anti-human pulmonary carcinoma monoclonal antibody. 4,892,935, Cl. 530-387.000.
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Pankonen, Andrew W.; Jester, Donald J.; Mulrow, Robert J.; Modica, Catherine P.; and Zdenek, John M., 4,893,325, Cl. 379-45.000.

Zebrose, Katherine L.: *See*—
Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., 4,893,316, Cl. 375-44.000.

Zegafuse, Donald W., Jr., deceased: *See*—
Dominguez, Ruben, Jr.; Finlay, David E.; Hanna, Stephen D.; Lopez, Jesus C.; Stevenson, David C.; and Zegafuse, Donald W., Jr., deceased, 4,893,257, Cl. 364-519.000.

Zeiner, Mark S.: *See*—
Fox, William D.; Nobis, Rudolph H.; Nuchols, Richard P.; and Zeiner, Mark S., 4,892,244, Cl. 227-8.000.

Zelickson, Barry M. Dispensing apparatus. 4,892,233, Cl. 222-226.000.

Zelle, Bruce R.: *See*—
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.

Zenjiro Okamoto: *See*—
Okamoto, Zenjiro, 4,892,384, Cl. 350-145.000.

Ziegenhorn, Joachim: *See*—
Kerscher, Lorenz; Pautz, Brigitte; Trunk, Gisela; and Ziegenhorn, Joachim, 4,892,815, Cl. 435-7.000.

Zillikens, Josef: *See*—
Steudle, Ernst; Boling, Gerd; and Zillikens, Josef, 4,891,968, Cl. 73-64.300.

Zimmer, Johannes. Device for the application of small and minimal amounts of flowable substances. 4,892,057, Cl. 118-248.000.

Zimmiond, Larry. Apparatus for flaring gas. 4,892,477, Cl. 431-202.000.

Ziolko, Eric F.: *See*—
Bright, Michael W.; Ziolko, Eric F.; Wilson, Alan L.; Bray, Michelle M.; Hennen, Harry A.; and Weiss, David L., 4,893,339, Cl. 380-28.000.
Wilson, Alan L.; Bright, Michael W.; Bray, Michelle M.; Ziolko, Eric F.; and Weiss, David L., 4,893,308, Cl. 370-109.000.

Zitomer, Kenneth J.: *See*—
Martin, Joseph P.; and Zitomer, Kenneth J., 4,892,658, Cl. 210-617.000.

Ziuchkovski, Michael J., to Planar Systems, Inc. Clock regeneration circuit employing digital phase locked loop. 4,893,319, Cl. 375-111.000.

Zivny, Zbig Z. Sportman's reusable, anti-collapsing urine collection device. 4,892,527, Cl. 604-353.000.

Zook, Eldon A.; and Niccum, Leonard M., to Harris-Kayot, Inc. Boat decking system and method of assembling same. 4,892,052, Cl. 114-85.000.

Zuber, Laurent, to Swiss Aluminium Ltd. Electromagnetic mold for continuous castings. 4,892,134, Cl. 164-503.000.

Zur, Yuval, to Elscint Ltd. Driven equilibrium in magnetic resonance imaging. 4,893,081, Cl. 324-309.000.

Zwack, Eduard, to Siemens Aktiengesellschaft. Method for temperature compensation of a voltage-controlled crystal oscillator in a phase control circuit. 4,893,097, Cl. 331-176.000.

Zweifel, Terry L., to Honeywell Inc. Windshear guidance for aircraft having inertial sensor. 4,893,245, Cl. 364-435.000.

501 Normetex: *See*—
Pottier, Daniel; Leclaire, Remy; and Vulliez, Paul, 4,892,010, Cl. 74-595.000.

501 Redexim B.V.: *See*—
Maria De Bree, Cornelius H.; and Reincke, Marinus, 4,891,888, Cl. 33-293.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JANUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Grone, Horst-Ditmar, to Lin Tec Verpackungstechnik GmbH. Tray for receiving foodstuffs and a process and apparatus for producing it. Re. 33,143, Cl. 206-557.000.

Hitachi, Ltd.: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000.

Hunter Engineering Company: *See*—
Hunter, Lee; and January, Daniel B., Re. 33,144, Cl. 356-152.000.

Hunter, Lee; and January, Daniel B., to Hunter Engineering Company. Vehicle wheel alignment apparatus. Re. 33,144, Cl. 356-152.000.

Ida, Michiaki: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000.

January, Daniel B.: *See*—
Hunter, Lee; and January, Daniel B., Re. 33,144, Cl. 356-152.000.

Kurimoto, Masaki: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000.

Lin Tec Verpackungstechnik GmbH: *See*—
Grone, Horst-Ditmar, Re. 33,143, Cl. 206-557.000.

Milwaukee Electric Tool Corporation: *See*—
Palm, Bernhard, Re. 33,145, Cl. 408-76.000.

Palm, Bernhard, to Milwaukee Electric Tool Corporation. Magnetic base for portable tools. Re. 33,145, Cl. 408-76.000.

Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, to Hitachi, Ltd. Centrifugal compressor. Re. 33,142, Cl. 417-365.000.

Sugimoto, Shigeo: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000.

Terasaki, Masatosi: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

American National Can Company: *See*—
Bofinger, Karl; and Hake, Walter T., B1 3,598,675, Cl. 156-172.000.

Aoki, Ryuji: *See*—
Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, B1 4,438,217, Cl. 502-205.000.

Bofinger, Karl; and Hake, Walter T., to American National Can Company. Method for securing strip members to container bodies. B1 3,598,675, 1-9-90, Cl. 156-172.000.

Brown, David P.: *See*—
Cook, Lynn W.; and Brown, David P., B1 4,391,705, Cl. 210-218.000.

Cook, Lynn W.; and Brown, David P., to Envirotech Corporation. Ballasting digestor covers. B1 4,391,705, 1-9-90, Cl. 210-218.000.

Copeland, Shannon B.: *See*—
Richards, Mark S.; and Copeland, Shannon B., B1 3,931,011, Cl. 210-136.000.

Envirotech Corporation: *See*—
Cook, Lynn W.; and Brown, David P., B1 4,391,705, Cl. 210-218.000.

Hake, Walter T.: *See*—
Bofinger, Karl; and Hake, Walter T., B1 3,598,675, Cl. 156-172.000.

Kugele, Thomas G., to Morton Thiokol Inc. Sulfide containing stabilizers. B1 4,120,845, 1-9-90, Cl. 524-181.000.

Morton Thiokol Inc.: *See*—
Kugele, Thomas G., B1 4,120,845, Cl. 524-181.000.

Nippon Shokubai Kagak Kogyo Co., Ltd.: *See*—
Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, B1 4,438,217, Cl. 502-205.000.

Parker-Hannifin Corporation: *See*—
Richards, Mark S.; and Copeland, Shannon B., B1 3,931,011, Cl. 210-136.000.

Richards, Mark S.; and Copeland, Shannon B., to Parker-Hannifin Corporation. Fluid separation apparatus. B1 3,931,011, 1-9-90, Cl. 210-136.000.

Sato, Takahisa: *See*—
Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, B1 4,438,217, Cl. 502-205.000.

Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, to Nippon Shokubai Kagak Kogyo Co., Ltd. Catalyst for oxidation of propylene. B1 4,438,217, 1-9-90, Cl. 502-205.000.

LIST OF DESIGN PATENTEES

Adams Mfg.: *See*—
Adams, William E., 305,431, Cl. D8-367.000.

Adams, William E., to Adams Mfg. Double hook for a wall. 305,431, 1-9-90, Cl. D8-367.000.

Addis Limited: *See*—
Dagge, David L., 305,467, Cl. D32-53.000.

Airship Developments Australia Pty. Ltd.: *See*—
Blake, Bruce N., 305,418, Cl. D12-345.000.

Americal Corporation: *See*—
Hubbard, Robert L., 305,384, Cl. D2-331.000.

American Standard Inc.: *See*—
Stairs, Henry M., Jr., 305,455, Cl. D23-254.000.

American Telephone and Telegraph Company: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.

Anton Discovery Group, Inc.: *See*—
Rundquist, Peter A., Jr., 305,449, Cl. D21-237.000.

Apogee, Inc.: *See*—
Valentine, Thomas, 305,446, Cl. D21-198.000.
Valentine, Thomas, 305,447, Cl. D21-198.000.

Arai, Takashi, to Asics Corporation. Shoe sole. 305,383, 1-9-90, Cl. D2-320.000.

Asics Corporation: *See*—
Arai, Takashi, 305,383, Cl. D2-320.000.
Kiyosawa, Junichi, 305,382, Cl. D2-320.000.
Mitsui, Shigeyuki, 305,381, Cl. D2-320.000.

AT&T Information Systems Inc.: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.

Atagi, Takashi, to Casio Computer Co., Ltd. Combined wristwatch and guard therefor. 305,411, 1-9-90, Cl. D10-31.000.

Balius, Mark A. Combined cooler chest and radio. 305,397, 1-9-90, Cl. D7-77.000.

Beal, Craig E., to Rain Bird Consumer Products Mfg. Corp. Hose end trigger nozzle. 305,454, 1-9-90, Cl. D23-226.000.

Beggs, Daniel J. Undershorts. 305,375, 1-9-90, Cl. D2-10.000.

Bellini, Mario, to Fehlbaum & Co. Chair. 305,389, 1-9-90, Cl. D6-379.000.

Bergman, Nils-Åke: *See*—
Widell, Gerald; Widell, Jan; and Bergman, Nils-Åke, 305,421, Cl. D13-13.000.

Berkheij, Jan, to Ericsson Paging Systems B.V. Radio pager. 305,428, 1-9-90, Cl. D14-191.000.

Berkheij, Jan, to Ericsson Paging Systems B.V. Radio pager. 305,429, 1-9-90, Cl. D14-191.000.

Blake, Bruce N., to Airship Developments Australia Pty. Ltd. Gondola for an airship. 305,418, 1-9-90, Cl. D12-345.000.

Brown, Paul D.; Ringel, Judith; and Miller, David E., to Reebok International Ltd. Shoe upper. 305,379, 1-9-90, Cl. D2-314.000.

Bujak, Walter E., Jr.; and Peitz, Robert W., Jr., to Carrier Corporation. Electronic control module cover. 305,420, 1-9-90, Cl. D13-12.000.

Canon Kabushiki Kaisha: *See*—
Doi, Susumu, 305,426, Cl. D14-124.000.
Omino, Seiichi; Noda, Atsushi; and Hiramatsu, Soichi, 305,435, Cl. D18-13.000.
Yoshioka, Eiichi; and Terasawa, Koji, 305,436, Cl. D18-13.000.

Carrier Corporation: *See*—
Bujak, Walter E., Jr.; and Peitz, Robert W., Jr., 305,420, Cl. D13-12.000.

Cartier International B.V.: *See*—
Perrin, Alain-Dominique, 305,404, Cl. D9-310.000.

Casio Computer Co., Ltd.: *See*—
Atagi, Takashi, 305,411, Cl. D10-31.000.

Claveria, Ric, to L.A. Gear, Inc. Shoe upper. 305,380, 1-9-90, Cl. D2-314.000.

Cohen, Robert A. Surface for a front panel for a video editing controller. 305,430, 1-9-90, Cl. D14-257.000.

Colebourne, Leonard: *See*—
Steer, David J.; Hawker, Steven; and Colebourne, Leonard, 305,422, Cl. D14-247.000.

Corey, John L. License plate frame. 305,417, 1-9-90, Cl. D12-193.000.

Cosmar Corporation: *See*—
LaJoie, Aldran H., 305,408, Cl. D9-415.000.

Costello, Brian K. Amphibious road vehicle. 305,414, 1-9-90, Cl. D12-3.000.

Dagge, David L., to Addis Limited. Bucket. 305,467, 1-9-90, Cl. D32-53.000.

Designcorp Australia Pty. Limited: *See*—
Spendler, Kevin F., 305,439, Cl. D19-1.000.

DeVilbiss Company, The: *See*—
Morgan, Fredrick M., 305,452, Cl. D23-225.000.
Morgan, Fredrick M., 305,453, Cl. D23-226.000.

Discovery Toys, Inc.: *See*—
Klitsner, Daniel B., 305,443, Cl. D21-143.000.

Doi, Susumu, to Canon Kabushiki Kaisha. Portable still video transmitter. 305,426, 1-9-90, Cl. D14-124.000.

Durand, Jean-Jacques. Wine glass or similar article. 305,392, 1-9-90, Cl. D7-13.000.

Epoch Company, Ltd.: *See*—
Ukisu, Hiroshi, 305,440, Cl. D21-59.000.

Ericsson Paging Systems B.V.: *See*—
Berkheij, Jan, 305,428, Cl. D14-191.000.
Berkheij, Jan, 305,429, Cl. D14-191.000.

Fehlbaum & Co.: *See*—
Bellini, Mario, 305,389, Cl. D6-379.000.

Freeman, Thomas R.: *See*—
Kemna, Jill L.; and Freeman, Thomas R., 305,378, Cl. D2-277.000.

Fresquez, Orlando O. Ornamental case. 305,474, 1-9-90, Cl. D34-45.000.

Fushiya, Fusao; and Kimata, Hirokazu, to Makita Electric Works, Ltd. Electric disc grinder. 305,399, 1-9-90, Cl. D8-62.000.

Garritano, Ralph F. Electronic harp. 305,434, 1-9-90, Cl. D17-16.000.

Gillette Canada Inc.: *See*—
Rams, Dieter; Greubel, Jurgen; and Schneider, Peter, 305,386, Cl. D4-104.000.

Gillette of Canada Inc.: *See*—
Schneider, Peter, 305,385, Cl. D4-104.000.

Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Communications workstation. 305,423, 1-9-90, Cl. D14-101.000.

Goldstein, Edwin: *See*—
Pitchersky, Steven J.; and Goldstein, Edwin, 305,390, Cl. D6-451.000.

Gonda, Frank E., to Lever Brothers Company. Combined dispensing bottle and cap. 305,407, 1-9-90, Cl. D9-376.000.

Graco Children's Products: *See*—
Rohrer, Samuel E.; and Hoffman, Ronald R., 305,416, Cl. D12-133.000.

Greubel, Jurgen: *See*—
Rams, Dieter; Greubel, Jurgen; and Schneider, Peter, 305,386, Cl. D4-104.000.

Guardian Products, Inc.: *See*—
Winston, Steven A., 305,401, Cl. D8-303.000.

Hara, Kunio; and Hiroki, Shin-ichi, to Kabushiki Kaisha Toshiba. Facsimile. 305,425, 1-9-90, Cl. D14-118.000.

Hashigaki, Yasunori, to Kubota, Ltd. Internal combustion engine. 305,432, 1-9-90, Cl. D15-1.000.

Hawker, Steven: *See*—
Steer, David J.; Hawker, Steven; and Colebourne, Leonard, 305,422, Cl. D14-247.000.

Hayes, Oneta R. Safety razor or the like. 305,465, 1-9-90, Cl. D28-46.000.

Hee, Park Kyung: *See*—
Sakata, Kiyoshi, 305,460, Cl. D25-114.000.

Helen of Troy Corporation: *See*—
Satoh, Teizoh, 305,466, Cl. D28-53.000.

Higashihara, Seiji: *See*—
Miura, Takeo; Takagi, Kiyoshi; and Higashihara, Seiji, 305,415, Cl. D12-110.000.

Hiramatsu, Soichi: *See*—
Omino, Seiichi; Noda, Atsushi; and Hiramatsu, Soichi, 305,435, Cl. D18-13.000.

Hiroki, Shin-ichi: *See*—
Hara, Kunio; and Hiroki, Shin-ichi, 305,425, Cl. D14-118.000.

Hoffman, Ronald R.: *See*—
Rohrer, Samuel E.; and Hoffman, Ronald R., 305,416, Cl. D12-133.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Miura, Takeo; Takagi, Kiyoshi; and Higashihara, Seiji, 305,415, Cl. D12-110.000.

Hubbard, Robert L., to Americal Corporation. Sock. 305,384, 1-9-90, Cl. D2-331.000.

Hum, Harvey: *See*—
Michaud, John T.; and Hum, Harvey, 305,409, Cl. D9-425.000.

Imaizumi, Koji: *See*—
Miyamoto, Isshin; and Imaizumi, Koji, 305,438, Cl. D18-36.000.

Interlego A.G.: *See*—
Knudsen, Jens N., 305,442, Cl. D21-108.000.

Johnson, Chris G.: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.

Johnson, Larry K., to Lawrence Brothers, Inc. Combined rescue door stop and striker plate. 305,403, 1-9-90, Cl. D8-402.000.

Kabushiki Kaisha Toshiba: *See*—
Hara, Kunio; and Hiroki, Shin-ichi, 305,425, Cl. D14-118.000.

Kabushiki Kaisha Yoshikawa Kuni Kogyosho: *See*—
Yoshikawa, Toshimichi, 305,470, Cl. D34-40.000.
Yoshikawa, Toshimichi, 305,471, Cl. D34-40.000.
Yoshikawa, Toshimichi, 305,472, Cl. D34-42.000.
Yoshikawa, Toshimichi, 305,473, Cl. D34-42.000.

Kemna, Jill L.; and Freeman, Thomas R., to Summerfield Industries, Inc. Shoe heel and counter protector. 305,378, 1-9-90, Cl. D2-277.000.

Kidde Consumer Durables Corp.: *See*—
Stewart, James B., 305,393, Cl. D7-21.000.

Kimata, Hirokazu: *See*—
Fushiya, Fusao; and Kimata, Hirokazu, 305,399, Cl. D8-62.000.

Kiyosawa, Junichi, to Asics Corporation. Shoe sole. 305,382, 1-9-90, Cl. D2-320.000.

Klitsner, Daniel B., to Discovery Toys, Inc. Jump marble race toy. 305,443, 1-9-90, Cl. D21-143.000.

Knudsen, Jens N., to Interlego A.G. Toy building lift element. 305,442, 1-9-90, Cl. D21-108.000.

Kobayashi, Hiroshi, to Nikon Corporation. Binoculars. 305,433, 1-9-90, Cl. D16-133.000.

Korneski, Michael. Rotating wind generator. 305,419, 1-9-90, Cl. D13-3.000.

Kubota, Ltd.: *See*—
Hashigaki, Yasunori, 305,432, Cl. D15-1.000.

L.A. Gear, Inc.: *See*—
Claveria, Ric, 305,380, Cl. D2-314.000.

Labatto, Cathy: *See*—
Labatto, Rudy; and Labatto, Cathy, 305,377, Cl. D2-229.000.

Labatto, Rudy; and Labatto, Cathy. Travel bib. 305,377, 1-9-90, Cl. D2-229.000.

LaJoie, Aldran H., to Cosmar Corporation. Clam shell package. 305,408, 1-9-90, Cl. D9-415.000.

Lawrence Brothers, Inc.: *See*—
Johnson, Larry K., 305,403, Cl. D8-402.000.

Lever Brothers Company: *See*—
Gonda, Frank E., 305,407, Cl. D9-376.000.
Tyler, Frank S., 305,410, Cl. D9-425.000.

Lovik, Craig J. Combined toy balloon and stuffer. 305,441, 1-9-90, Cl. D21-84.000.

Makita Electric Works, Ltd.: *See*—
Fushiya, Fusao; and Kimata, Hirokazu, 305,399, Cl. D8-62.000.

Mariol, James F., to Rubbermaid Commercial Products. Infant booster chair. 305,387, 1-9-90, Cl. D6-333.000.

Martinus, Joseph G. Necktie restraint. 305,413, 1-9-90, Cl. D11-202.000.

Mascheroni, Mark. Cantilevered chair. 305,388, 1-9-90, Cl. D6-372.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Miyamoto, Isahin; and Imaizumi, Koji, 305,438, Cl. D18-36.000.

Mautner, Sarah M. Combined basket and removable liner. 305,469, 1-9-90, Cl. D34-40.000.

Michaud, John T.; and Hum, Harvey, to Packaging Corporation of America. Tray with cover. 305,409, 1-9-90, Cl. D9-425.000.

Miller, David E.: *See*—
Brown, Paul D.; Ringel, Judith; and Miller, David E., 305,379, Cl. D2-314.000.

Mission Kleensweep Products, Inc.: *See*—
Rosenbaum, Robert S., 305,451, Cl. D23-225.000.

Mitsui, Shigeyuki, to Asics Corporation. Shoe sole. 305,381, 1-9-90, Cl. D2-320.000.

Miura, Takeo; Takagi, Kiyoshi; and Higashihara, Seiji, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 305,415, 1-9-90, Cl. D12-110.000.

Miyamoto, Isshin; and Imaizumi, Koji, to Matsushita Electric Industrial Co., Ltd.; and Plus Corporation. Portable copying machine. 305,438, 1-9-90, Cl. D18-36.000.

Morgan, Fredrick M., to DeVilbiss Company, The. Spray gun unit. 305,452, 1-9-90, Cl. D23-225.000.

Morgan, Fredrick M., to DeVilbiss Company, The. Spray gun. 305,453, 1-9-90, Cl. D23-226.000.

Moritani, Hiroshi, to Sharp Corporation. Air conditioner. 305,456, 1-9-90, Cl. D23-353.000.

Motorola, Inc.: *See*—
Soren, Leonid; and Nagele, Albert L., 305,427, Cl. D14-138.000.

Nagele, Albert L.: *See*—
Soren, Leonid; and Nagele, Albert L., 305,427, Cl. D14-138.000.

Nakao, Kaname, to Sharp Corporation. Deodorizer. 305,457, 1-9-90, Cl. D23-366.000.

Nikon Corporation: *See*—
Kobayashi, Hiroshi, 305,433, Cl. D16-133.000.

Nitta, Tomio, to Tokai Corporation. Cigarette lighter. 305,462, 1-9-90, Cl. D27-156.000.

Noble, Barbara A.: *See*—
Noble, Jack B.; and Noble, Barbara A., 305,450, Cl. D22-142.000.

Noble, Jack B.; and Noble, Barbara A. Combined fishing pole, night light and bite indicator light. 305,450, 1-9-90, Cl. D22-142.000.

Noda, Atsushi: *See*—
Omino, Seiichi; Noda, Atsushi; and Hiramatsu, Soichi, 305,435, Cl. D18-13.000.

Novak, David M. Clamp for holding a towel or the like on a bar. 305,402, 1-9-90, Cl. D8-395.000.

Olesen, Paul, to Swingline Inc. Stapler. 305,398, 1-9-90, Cl. D8-49.000.

Omino, Seiichi; Noda, Atsushi; and Hiramatsu, Soichi, to Canon Kabushiki Kaisha. Printer. 305,435, 1-9-90, Cl. D18-13.000.

Ovotherm Verpackungsproduktions: *See*—
Wilkinson, Ian G., 305,405, Cl. D9-345.000.

Packaging Corporation of America: *See*—
Michaud, John T.; and Hum, Harvey, 305,409, Cl. D9-425.000.

Peitz, Robert W., Jr.: *See*—
Bujak, Walter E., Jr.; and Peitz, Robert W., Jr., 305,420, Cl. D13-12.000.

Perrin, Alain-Dominique, to Cartier International B.V. Perfume container. 305,404, 1-9-90, Cl. D9-310.000.

Petrovich, Richard L. Hand held sander. 305,400, 1-9-90, Cl. D8-90.000.

Petty, Norman W.: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.

Pike, Charles V. Molding. 305,461, 1-9-90, Cl. D25-136.000.

Pitchersky, Steven J.; and Goldstein, Edwin, to Pitchersky, Steven J.; and Goldstein, Edwin. Table. 305,390, 1-9-90, Cl. D6-451.000.

Plessey Overseas Limited: *See*—
Steer, David J.; Hawker, Steven; and Colebourne, Leonard, 305,422, Cl. D14-247.000.

Plus Corporation: *See*—
Miyamoto, Isshin; and Imaizumi, Koji, 305,438, Cl. D18-36.000.

Pressley, Leonard E., Sr. Combination drawing pen and enclosure for a computer mouse for generating free hand computer graphics. 305,424, 1-9-90, Cl. D14-114.000.

Puignero, Luis F. Combined food container cover and coaster. 305,394, 1-9-90, Cl. D7-40.000.

Rain Bird Consumer Products Mfg. Corp: *See*—
Beal, Craig E., 305,454, Cl. D23-226.000.

Ramos, Raymond, Jr. Physical exerciser. 305,445, 1-9-90, Cl. D21-191.000.

Rams, Dieter; Greubel, Jurgen; and Schneider, Peter, to Gillette Canada Inc. Toothbrush. 305,386, 1-9-90, Cl. D4-104.000.

Reebok International Ltd.: *See*—
Brown, Paul D.; Ringel, Judith; and Miller, David E., 305,379, Cl. D2-314.000.

Rickard, Lee; and Rickard, Peggy. Blow dryer. 305,464, 1-9-90, Cl. D28-12.000.

Rickard, Peggy: *See*—
Rickard, Lee; and Rickard, Peggy, 305,464, Cl. D28-12.000.

Ringel, Judith: *See*—
Brown, Paul D.; Ringel, Judith; and Miller, David E., 305,379, Cl. D2-314.000.

Rohrer, Samuel E.; and Hoffman, Ronald R., to Graco Children's Products. Baby walker's seat cover. 305,416, 1-9-90, Cl. D12-133.000.

Rosenbaum, Robert S., to Mission Kleensweep Products, Inc. Combined sprayer and refill container. 305,451, 1-9-90, Cl. D23-225.000.

Rubbermaid Commercial Products: *See*—
Mariol, James F., 305,387, Cl. D6-333.000.

Rundquist, Peter A., Jr., to Anton Discovery Group, Inc. Float. 305,449, 1-9-90, Cl. D21-237.000.

Russell, Susan. Patient gown. 305,376, 1-9-90, Cl. D2-29.000.

Sakata, Kiyoshi, to Hee, Park Kyung. Brick. 305,460, 1-9-90, Cl. D25-114.000.

Satoh, Teizoh, to Helen of Troy Corporation. Electric moustache and beard trimmer or similar article. 305,466, 1-9-90, Cl. D28-53.000.

Schneider, Peter, to Gillette of Canada Inc. Toothbrush. 305,385, 1-9-90, Cl. D4-104.000.

Schneider, Peter: *See*—
Rams, Dieter; Greubel, Jurgen; and Schneider, Peter, 305,386, Cl. D4-104.000.

Seelye, Barbara A.: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.

Sharp Corporation: *See*—
Moritani, Hiroshi, 305,456, Cl. D23-353.000.
Nakao, Kaname, 305,457, Cl. D23-366.000.

Smith, Lois G. Feeding nipple. 305,459, 1-9-90, Cl. D24-46.000.

Soren, Leonid; and Nagele, Albert L., to Motorola, Inc. Housing for a portable handset telephone or similar article. 305,427, 1-9-90, Cl. D14-138.000.

Spendier, Kevin F., to Designcorp Australia Pty. Limited. Card. 305,439, 1-9-90, Cl. D19-1.000.

Spiegel, H. Jay. Kicking tee base. 305,448, 1-9-90, Cl. D21-209.000.

Stairs, Henry M., Jr., to American Standard Inc. Combined bathtub overflow drain cover and drain control handle. 305,455, 1-9-90, Cl. D23-254.000.

Steelman, Charles. Bottle holder. 305,395, 1-9-90, Cl. D7-70.000.

Steer, David J.; Hawker, Steven; and Colebourne, Leonard, to Plessey Overseas Limited. Three keypad pushbutton set for telecommunications instruments. 305,422, 1-9-90, Cl. D14-247.000.

Stewart, James B., to Kidde Consumer Durables Corp. Combined cooking and storage container. 305,393, 1-9-90, Cl. D7-21.000.

Strohschein, Arvid. Grandma doll. 305,444, 1-9-90, Cl. D21-175.000.

Summerfield Industries, Inc.: *See*—
Kemna, Jill L.; and Freeman, Thomas R., 305,378, Cl. D2-277.000.

Swingline Inc.: *See*—
Olesen, Paul, 305,398, Cl. D8-49.000.

Takagi, Kiyoshi: *See*—
Miura, Takeo; Takagi, Kiyoshi; and Higashihara, Seiji, 305,415, Cl. D12-110.000.

Terasawa, Koji: *See*—
Yoshioka, Eiichi; and Terasawa, Koji, 305,436, Cl. D18-13.000.

Thune, Matteo, to Wella Aktiengesellschaft. Bottle. 305,406, 1-9-90, Cl. D9-373.000.

Tierney, Thomas J., Jr.: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.

Tokai Corporation: *See*—
Nitta, Tomio, 305,462, Cl. D27-156.000.

Tyler, Frank S., to Lever Brothers Company. Packaging container. 305,410, 1-9-90, Cl. D9-425.000.

Ukisu, Hiroshi, to Epoch Company, Ltd. Simulative toy tool. 305,440, 1-9-90, Cl. D21-59.000.

Valentine, Thomas, to Apogee, Inc. Jumprope. 305,446, 1-9-90, Cl. D21-198.000.

Valentine, Thomas, to Apogee, Inc. Jumprope. 305,447, 1-9-90, Cl. D21-198.000.

Wang, Austin. Massage cushion or similar article. 305,458, 1-9-90, Cl. D24-40.000.

Wella Aktiengesellschaft: *See*—
Thune, Matteo, 305,406, Cl. D9-373.000.

Weller, Mark. Combined food container and heating element. 305,396, 1-9-90, Cl. D7-77.000.

Wendling, Leonard W. Font of type. 305,437, 1-9-90, Cl. D18-24.000.

Whitney, Michael G. Bathroom cabinet. 305,391, 1-9-90, Cl. D6-561.000.

Widell, Harald; Widell, Jan; and Bergman, Nils-Åke. Conductor strip for electrical and telecommunication conductors. 305,421, 1-9-90, Cl. D13-13.000.

Widell, Jan: *See*—
Widell, Harald; Widell, Jan; and Bergman, Nils-Åke, 305,421, Cl. D13-13.000.

Wilkinson, Ian G., to Ovotherm Verpackungsproduktions. Egg carton. 305,405, 1-9-90, Cl. D9-345.000.

Winston, Steven A., to Guardian Products, Inc. Anatomical handgrip. 305,401, 1-9-90, Cl. D8-303.000.

Yonkers, Edward H. Combined snow and ice remover and scraper. 305,468, 1-9-90, Cl. D32-49.000.

Yoshikawa, Toshimichi, to Kabushiki Kaisha Yoshikawa Kuni Kogyosho. Dust basket. 305,470, 1-9-90, Cl. D34-40.000.

Yoshikawa, Toshimichi, to Kabushiki Kaisha Yoshikawa Kuni Kogyosho. Dust basket. 305,471, 1-9-90, Cl. D34-40.000.

Yoshikawa, Toshimichi, to Kabushiki Kaisha Yoshikawa Kuni Kogyosho. Basket. 305,472, 1-9-90, Cl. D34-42.000.

Yoshikawa, Toshimichi, to Kabushiki Kaisha Yoshikawa Kuni Kogyosho. Basket. 305,473, 1-9-90, Cl. D34-42.000.

Yoshioka, Eiichi; and Terasawa, Koji, to Canon Kabushiki Kaisha. Printer. 305,436, 1-9-90, Cl. D18-13.000.

Zango, Linda. Cosmetic sampler. 305,463, 1-9-90, Cl. D28-7.000.

Zemer, Jack D. Jewelry clasp. 305,412, 1-9-90, Cl. D11-87.000.

LIST OF PLANT PATENTEES

Drewlow, Lyndon W., to Mikkelsens, Inc. Impatiens plant named Nebulous. 7,097, 1-9-90, Cl. 68.000.

Drewlow, Lyndon W., to Mikkelsens, Inc. Impatiens plant named Radiance. 7,098, 1-9-90, Cl. 68.000.

Gebr. Vletter & J.A. Den Haan: *See*—
Vletter, Floris, 7,100, Cl. 68.000.
Vletter, Floris, 7,101, Cl. 68.000.

Holtkamp, Reinhold, Sr. African violet plant named Little Aquamarine. 7,099, 1-9-90, Cl. 69.000.

Holtkamp, Reinhold, Sr. African violet plant named Little Tourmaline. 7,102, 1-9-90, Cl. 69.000.

Holtkamp, Reinhold, Sr. African violet plant named Little Violet Sapphire. 7,103, 1-9-90, Cl. 69.000.

Holtkamp, Reinhold, Sr. African violet plant named Irene. 7,104, 1-9-90, Cl. 69.000.

Jackson & Perkins Company: *See*—
Warriner, William A., 7,096, Cl. 11.000.

Kummer, David A. Mushroom plant, *Pleurotus ostreatus* kummeri. 7,105, 1-9-90, Cl. 89.000.

Mikkelsens, Inc.: *See*—
Drewlow, Lyndon W., 7,097, Cl. 68.000.
Drewlow, Lyndon W., 7,098, Cl. 68.000.

Vletter, Floris, to Gebr. Vletter & J.A. Den Haan. Lily plant named Avignon. 7,100, 1-9-90, Cl. 68.000.

Vletter, Floris, to Gebr. Vletter & J.A. den Haan. Lily plant named Geneve. 7,101, 1-9-90, Cl. 68.000.

Warriner, William A., to Jackson & Perkins Company. Rose plant Jacbro. 7,096, 1-9-90, Cl. 11.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 9, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

19	4,891,845
49 R	4,891,846

CLASS 4

239	4,891,847
571	4,891,848
575	4,891,849
609	4,891,850

CLASS 5

81 R	4,891,851
105	4,891,852
247	4,891,853
435	4,891,854
449	4,891,855
496	4,891,856

CLASS 8

101	4,892,555
436	4,892,556
497	4,892,557
560	4,892,558

CLASS 15

21 R	4,891,857
82	4,891,858
210 B	4,891,859
312 A	4,891,860
344	4,891,861

CLASS 16

278	4,891,862

CLASS 19

80 R	4,891,863

CLASS 22

413	4,892,970

CLASS 24

3 H	4,891,865
170	4,891,866
408	4,891,867
691	4,891,868

CLASS 27

4	4,891,869

CLASS 28

205	4,891,871
244	4,891,872
255	4,891,873

CLASS 29

115	4,891,874
156.5 R	4,891,875
156.8 R	4,891,876
237	4,891,877
603	4,891,878
623.3	4,892,559
822	4,891,879

CLASS 30

34.05	4,891,880
123	4,891,881
123.3	4,891,882
190	4,891,883
277.4	4,891,884
355	4,891,885
363	4,891,886
366	4,891,887

CLASS 33

293	4,891,888
503	4,891,889

CLASS 34

12	4,891,890
23	4,891,891
86	4,891,892

CLASS 37

67	4,891,893

CLASS 38

66	4,891,894

CLASS 40

209	4,891,895
541	4,891,896
618	4,891,897

CLASS 42

69.02	4,891,898

CLASS 43

22	4,891,899
42.11	4,891,901
42.5	4,891,900
43.11	4,891,902
44.89	4,891,903
112	4,891,904

CLASS 44

50	4,892,560
51	4,892,561
67	4,892,562
73	4,892,563

CLASS 47

66	4,891,905

CLASS 49

65	4,891,906
67	4,891,907
199	4,891,908
391	4,891,909
395	4,891,910
404	4,891,911
484	4,891,912
493	4,891,913

CLASS 51

105 R	4,891,914
170 T	4,891,915
230	4,891,916

CLASS 52

1	4,891,917
3	4,891,918
79.5	4,891,919
145	4,891,920
207	4,891,921
239	4,891,922
280	4,891,923
520	4,891,924
585	4,891,925
637	4,891,926
642	4,891,927

CLASS 53

250	4,891,928
451	4,891,929
587	4,891,930

CLASS 55

16	4,892,564
26	4,892,565
	4,892,566
33	4,892,567
73	4,892,568
163	4,892,569
269	4,892,570
458	4,892,571

CLASS 56

16.7	4,891,931
158	4,891,932

CLASS 57

269	4,891,933

CLASS 60

39.08	4,891,934
39.182	4,891,937
39.36	4,891,936
39.37	4,891,935
245	4,891,938
278	4,891,939
320	4,891,940
416	4,891,941
436	4,891,942
464	4,891,943
489	4,891,944
547.1	4,891,945
602	4,891,946
	4,891,947
645	4,891,948

CLASS 62

3.2	4,891,949
37	4,891,950
51.3	4,891,951
199	4,891,952
209	4,891,953
239	4,891,954
295	4,891,955

CLASS 63

3	4,891,956

CLASS 65

10.1	4,892,572
179	4,892,573
273	4,892,574

CLASS 66

192	4,891,957
196	4,891,958

CLASS 68

23.7	4,891,959
200	4,891,960

CLASS 70

456 R	4,891,961

CLASS 71

90	4,892,575
93	4,892,576
	4,892,577
94	4,892,578

CLASS 72

88	4,891,962
203	4,891,963
308	4,891,964
481	4,891,965

CLASS 73

19	4,891,966
38	4,891,967
61.1 R	4,891,969
64.3	4,891,968
116	4,891,970
117.3	4,891,971
119 R	4,891,972
146.5	4,891,973
160	4,891,974
168	4,891,975
189	4,891,976
204.26	4,891,977
	4,891,978
269	4,891,979
290 R	4,891,980
460	4,891,981
497	4,891,982
517 B	4,891,983
517 R	4,891,984
	4,891,985
634	4,891,986
732	4,891,987
861.22	4,891,988
	4,891,989
861.24	4,891,990
861.38	4,891,991
862.36	4,891,992
863.52	4,891,993

CLASS 74

2	4,891,994
3.52	4,891,995
5.46	4,891,997
6	4,891,996
48	4,891,998
337.5	4,891,999
467	4,892,000
477	4,892,001
492	4,892,002
501.5 R	4,892,003
	4,892,004
502.4	4,892,005
552	4,892,006
	4,892,007
574	4,892,008
594.6	4,892,009
595	4,892,010
761	4,892,011
772	4,892,012
785	4,892,013
866	4,892,014

CLASS 75

0.5 B	4,892,579
53	4,892,580
232	4,892,581
251	4,892,582

CLASS 81

9.41	4,892,015
128	4,892,016
492	4,892,017

CLASS 83

15	4,892,018
105	4,892,019
463	4,892,020
468	4,892,021
478	4,892,022

CLASS 84

313	4,892,025
687	4,892,023
719	4,892,024

CLASS 89

140	4,892,026

CLASS 91

369.2	4,892,027
399	4,891,864
517	4,892,028

CLASS 92

51	4,892,029

CLASS 98

1	4,892,030

CLASS 99

284	4,892,031
421 HV	4,892,032
455	4,892,033
567	4,892,034

CLASS 028

107	4,891,870

CLASS 101

148	4,892,035
240	4,892,036

CLASS 102

201	4,892,037
439	4,892,038
476	4,892,039

CLASS 104

6	4,892,040
140	4,892,041

CLASS 105

362	4,892,042

CLASS 106

18.32	4,892,583
22	4,892,584
38.22	4,892,585
92	4,892,586
123.1	4,892,587
	4,892,588
197.1	4,892,589
214	4,892,590
482	4,892,591

CLASS 108

90	4,892,043
154	4,892,044

CLASS 110

203	4,892,045
332	4,892,046

CLASS 112

122	4,892,047
254	4,892,048
265.2	4,892,049
458	4,892,050

CLASS 114

1	4,892,051
85	4,892,052
303	4,892,053
357	4,892,054
	4,892,055

CLASS 118

126	4,892,056
248	4,892,057

CLASS 119

1	4,892,058
3	4,892,059
52.2	4,892,060
75	4,892,061
98	4,892,062
109	4,892,063

CLASS 122

366	4,892,064

CLASS 123

26	4,892,065
73 V	4,892,066
90.12	4,892,067
182	4,892,068
193 CH	4,892,069
274	4,892,070
336	4,892,071
340	4,892,072
417	4,892,073
425	4,892,074
	4,892,075
442	4,892,076
487	4,892,077
489	4,892,078
602	4,892,079
604	4,892,080

CLASS 124

65	4,892,081

CLASS 125

11 R	4,892,082

CLASS 126

21 R	4,892,083
92 AC	4,892,084
340	4,892,085
409	4,892,086
512	4,892,087
540	4,892,088

CLASS 128

24 A	4,892,089
58	4,892,090
62 R	4,892,091
76 B	4,892,092
201.28	4,892,094
207.14	4,892,095
419 PG	4,892,100
633	4,892,101
642	4,892,102
660.01	4,892,103
697	4,892,104
741	4,892,105
745	4,892,106
763	4,892,107
784	4,892,108

CLASS 129

1 R	4,892,119

CLASS 131

194	4,892,109

CLASS 132

273	4,892,110

CLASS 134

66	4,892,111
102	4,892,112

CLASS 136

244	4,892,592
246	4,892,593
258	4,892,594

CLASS 137

78.3	4,892,113
87	4,892,114
269	4,892,115
360	4,892,116
614.03	4,892,117
625.3	4,892,118

CLASS 139

21	4,892,120
185	4,892,121

CLASS 140

123	4,892,122

CLASS 141

7	4,892,123
114	4,892,124
353	4,892,125
381	4,892,126

CLASS 148

12 R	4,892,595
104	4,892,596

CLASS 149

91	4,892,597

CLASS 152

221	4,892,127
417	4,892,128
516	4,892,129

CLASS 156

91	4,892,598
94	4,892,599
	4,892,601
166	4,892,600
172	B1 3,598,675
233	4,892,602
244.11	4,892,603
244.24	4,892,604
272.6	4,892,605
275.5	4,892,606
275.7	4,892,607
406.4	4,892,609
421	4,892,608
446	4,892,610
504	4,892,611
636	4,892,612
643	4,892,613
	4,892,614
	4,892,615
655	4,892,616
659.1	4,892,617

CLASS 162

16	4,892,618
49	4,892,619
158	4,892,620
198	4,892,621
208	4,892,622
344	4,892,623

CLASS 164

97	4,892,130
312	4,892,131
431	4,892,132
452	4,892,133
503	4,892,134

CLASS 165

42	4,892,135
51	4,892,136
80.1	4,892,137
	4,892,138
95	4,892,139
110	4,892,140
133	4,892,141
134.1	4,892,142
152	4,892,143

CLASS 166

122	4,892,144
171	4,892,145
270	4,892,146
280	4,892,147
305.1	4,892,148
379	4,892,149

CLASS 168

4	4,892,150

CLASS 171

16	4,892,151

CLASS 172

20	4,892,152
	4,892,153
72	4,892,154
199	4,892,155
381	4,892,156
430	4,892,157
443	4,892,158

CLASS 174

38	4,892,978
153 G	4,892,979

CLASS 175

85	4,892,160
195	4,892,161
336	4,892,159

CLASS 177

25.15	4,892,162
211	4,892,163

CLASS 180

68.3 4,892,164
190 4,892,165
208 4,892,166
287 4,892,167

CLASS 181

250 4,892,168

CLASS 182

100 4,892,170
138 4,892,169

CLASS 184

105.3 4,892,171

CLASS 188

69 4,892,172
73.44 4,892,173
378 4,892,174

CLASS 191

14 4,892,980

CLASS 192

12 BA 4,892,175
84 C 4,892,176
106.2 4,892,177
4,892,178

CLASS 198

365 4,892,179
375 4,892,180
434 4,892,181
454 4,892,182
468.3 4,892,183
476.1 4,892,184
477.1 4,892,185
803.01 4,892,186

CLASS 200

5 A 4,892,981
38 R 4,892,982
4,892,983
61.86 4,892,984
83 N 4,892,985
144 B 4,892,986
296 4,892,987
516 4,892,988

CLASS 203

37 4,892,624
86 4,892,625

CLASS 204

15 4,892,626
16 4,892,627
44.7 4,892,628
56.1 4,892,629
59.5 4,892,630
109 4,892,631
128 4,892,632
192.12 4,892,633
192.15 4,892,634
192.36 4,892,635
237 4,892,636
291 4,892,637
299 R 4,892,638
4,892,639
418 4,892,640

CLASS 206

217 4,892,187
223 4,892,188
232 4,892,189
335 4,892,190
366 4,892,191
425 4,892,192
453 4,892,193
470 4,892,194
473 4,892,195
523 4,892,196
557 Re.33,143

CLASS 208

39 4,892,641
4,892,642
70 4,892,643
107 4,892,644
111 4,892,645
4,892,646

CLASS 209

11 4,892,647
164 4,892,648
166 4,892,649
621 4,892,650

CLASS 210

136 B1 3,931,011
151 4,892,651
160 4,892,652
184 4,892,653
198.2 4,892,654
218 B1 4,391,705
222 4,892,655
232 4,892,656
4,892,657
617 4,892,658
635 4,892,659
637 4,892,660
640 4,892,661
649 4,892,662
729 4,892,663
747 4,892,664
770 4,892,665
776 4,892,666
782 4,892,668
799 4,892,667

CLASS 211

14 4,892,197
41 4,892,198
51 4,892,199
193 4,892,200

CLASS 212

186 4,892,201
192 4,892,202
221 4,892,203

CLASS 213

1.6 4,892,204

CLASS 215

1 C 4,892,205
12.1 4,892,206
100 A 4,892,207
216 4,892,208
277 4,892,209

CLASS 219

69.13 4,892,989
76.14 4,892,990
121.74 4,892,991
121.78 4,892,992
125.1 4,892,993
216 4,892,994
230 4,892,995
301 4,892,996
461 4,892,997
548 4,892,998

CLASS 220

1.5 4,892,210
3.2 4,892,211
3.3 4,892,212
4 B 4,892,213
67 4,892,214
69 4,892,215
206 4,892,216
258 4,892,217
263 4,892,218
287 4,892,219
339 4,892,220
343 4,892,221
356 4,892,222
404 4,892,223
4,892,224
408 4,892,225
412 4,892,226
450 4,892,227

CLASS 222

79 4,892,228
105 4,892,229
4,892,230
207 4,892,231
4,892,232
226 4,892,233
484 4,892,234
607 4,892,235
640 4,892,236

CLASS 223

85 4,892,237
92 4,892,238
111 4,892,239

CLASS 224

211 4,892,240
216 4,892,241

CLASS 225

2 4,892,242

CLASS 226

97 4,892,243

CLASS 227

8 4,892,244

CLASS 228

180.2 4,892,245

CLASS 229

92.8 4,892,246
125.26 4,892,247

CLASS 235

1 D 4,892,999
380 4,893,000
490 4,893,001

CLASS 237

12.3 B 4,892,248

CLASS 238

8 4,892,249

CLASS 239

18 4,892,250
150 4,892,251
205 4,892,252
265.35 4,892,253
265.41 4,892,254
682 4,892,255
734 4,892,256

CLASS 241

32 4,892,257
79.3 4,892,258
101.7 4,892,259
282.2 4,892,260
301 4,892,261

CLASS 242

58.3 4,892,263
58.6 4,892,264
67.1 R 4,892,265
157.1 4,892,262
199 4,892,266
228 4,892,267

CLASS 244

3.1 4,892,268
53 R 4,892,269
104 R 4,892,270
121 4,892,271
153 R 4,892,272
158 R 4,892,273
213 4,892,274

CLASS 248

61 4,892,275
74.1 4,892,276
101 4,892,277
124 4,892,278
125 4,892,279
230 4,892,280
311.2 4,892,281
430 4,892,282
466 4,892,283
476 4,892,284

CLASS 250

214 R 4,893,002
216 4,893,003
221 4,893,004
4,893,005
227 4,893,006
231 SE 4,893,007
234 4,893,008
310 4,893,009
318 4,893,010
327.2 4,893,011
4,893,012
336.1 4,893,013
353 4,893,014
369 4,893,015
370.07 4,893,017
370.09 4,893,016
370.10 4,893,018
423 R 4,893,019
483.1 4,893,020
487.1 4,893,021
506.1 4,893,022
515.1 4,893,023
560 4,893,024
561 4,893,025
574 4,893,026

CLASS 251

129.05 4,892,285
129.11 4,892,286
172 4,892,287
306 4,892,288
368 4,892,289

CLASS 252

30 4,892,669
37 4,892,670
51.5 R 4,892,671
62.51 4,892,672
114 4,892,673
189 4,892,674
299.01 4,892,675
299.61 4,892,676
408.1 4,892,677
500 4,892,678
565 4,892,680
582 4,892,681
589 4,892,682
609 4,892,683
626 4,892,684
628 4,892,685

CLASS 254

49 4,892,290
342 4,892,291

CLASS 256

66 4,892,292

CLASS 260

404 4,892,687

CLASS 261

24 4,892,688

CLASS 264

25 4,892,689
40.1 4,892,690
54 4,892,691
65 4,892,848
106 4,892,692
108 4,892,693
109 4,892,694
119 4,892,695
219 4,892,696
234 4,892,697
243 4,892,698
328.8 4,892,699
510 4,892,700

CLASS 266

193 4,892,293
233 4,892,294

CLASS 269

8 4,892,295
21 4,892,296

CLASS 270

38 4,892,297

CLASS 271

18.3 4,892,298
110 4,892,299
225 4,892,300
227 4,892,301

CLASS 272

74 4,892,302
98 4,892,303
126 4,892,304
127 4,892,305

CLASS 273

1 GA 4,892,306
1 GF 4,892,307
63 B 4,892,308
127 R 4,892,309
144 A 4,892,310
145 D 4,892,311
148 B 4,892,312
148 R 4,892,313
162 D 4,892,314
166 4,892,315
167 E 4,892,316
183 B 4,892,317
201 4,892,318
272 4,892,319

CLASS 277

125 4,892,320
167.5 4,892,321
207 R 4,892,322

CLASS 280

250.1 4,892,323
440 4,892,324
612 4,892,325
618 4,892,326
650 4,892,327
707 4,892,328
772 4,892,329
775 4,892,330
808 4,892,331
842 4,892,332

CLASS 281

15.1 4,892,333
45 4,892,334

CLASS 283

75 4,892,335
91 4,892,336

CLASS 285

333 4,892,337

CLASS 292

35 4,892,338
201 4,892,339
4,892,340
341.12 4,892,341
347 4,892,342

CLASS 294

64.1 4,892,343
88 4,892,344

CLASS 296

24.1 4,892,345
37.6 4,892,346
75 4,892,347
146 4,892,348
156 4,892,349
204 4,892,350
213 4,892,351

CLASS 297

195 4,892,352
224 4,892,353
301 4,892,354
440 4,892,355
457 4,892,356
464 4,892,357

CLASS 299

37 4,892,358
4,892,359

CLASS 303

9.61 4,892,360
114 4,892,361
115 4,892,362
116 4,892,363
4,892,364

CLASS 305

58 R 4,892,365

CLASS 307

116 4,893,027
291 4,893,028
296.4 4,893,029
296.8 4,893,030
451 4,893,031
456 4,893,032
465 4,893,033
480 4,893,034
520 4,893,035
603 4,893,036

CLASS 310

68 B 4,893,037
83 4,893,038
89 4,893,039
156 4,893,040
215 4,893,041
216 4,893,042
239 4,893,043
261 4,893,044
323 4,893,045
4,893,046
4,893,047
331 4,893,048
338 4,893,049

CLASS 312

140.4 4,892,366
328 4,892,367
348 4,892,368

CLASS 313

113 4,893,050
141 4,893,051
346 R 4,893,052
400 4,893,053
408 4,893,054
479 4,893,055
495 4,893,056
631 4,893,057

CLASS 315

5 4,893,058
127 4,893,059
169.3 4,893,060
227 R 4,893,061
291 4,893,062
307 4,893,063
317 4,893,064
371 4,893,065

CLASS 318

600 4,893,066
615 4,893,068

CLASS 323

215 4,893,069
270 4,893,070

CLASS 324

117 H 4,893,073
158 F 4,893,074
174 4,893,075
207 4,893,076
208 4,893,077
4,893,078
225 4,893,079
309 4,893,080
4,893,081
312 4,893,082
318 4,893,083
341 4,893,084
378 4,893,085
545 4,893,086
660 4,893,071

CLASS 328

14 4,893,087
127 4,893,088
233 4,893,089

CLASS 330

253 4,893,090
4,893,091
4,893,092
295 4,893,093

CLASS 331

1 A 4,893,094
57 4,893,095
175 4,893,096
176 4,893,097

CLASS 333

17.1 4,893,099
112 4,893,098

CLASS 334

39 4,893,100

CLASS 335

18 4,893,101
132 4,893,102
216 4,893,103
266 4,893,104

CLASS 336

84 M 4,893,105

CLASS 337

159 4,893,106
186 4,893,107

CLASS 338

34 4,893,108

CLASS 340

438 4,893,109
442 4,893,110
471 4,893,111
479 4,893,112
632 4,893,113
703 4,893,114
712 4,893,115
747 4,893,116
784 4,893,117
825.54 4,893,118
928 4,893,119

CLASS 341

15 4,893,121
31 4,893,120
122 4,893,122
143 4,893,123
156 4,893,124

CLASS 342

129 4,893,125
175 4,893,126
379 4,893,128
386 4,893,127

CLASS 343

700 MS 4,893,129
713 4,893,131
715 4,893,130
912 4,893,132

CLASS 346

76 PH 4,893,133
4,893,134
108 4,893,135
4,893,136
134 4,893,137
140 R 4,893,138

CLASS 350

3.7 4,892,369
3.74 4,892,370
6.8 4,892,371
4,892,372
96.10 4,892,373
96.15 4,892,374
96.18 4,892,375
96.2 4,892,377
96.20 4,892,376
4,892,378
96.21 4,892,379
4,892,380
96.22 4,892,381
96.23 4,892,382
96.29 4,892,383
145 4,892,384
162.23 4,892,385
174 4,892,386
319 4,892,387
320 4,892,388
333 4,892,389
335 4,892,390
339 F 4,892,391
339 R 4,892,392
350 S 4,892,393
357 4,892,394
416 4,892,395
423 4,892,396
425 4,892,397
475 4,892,398
569 4,892,399
626 4,892,400
4,892,401

CLASS 351
160 H 4,892,402
168 4,892,403

CLASS 352
192 4,892,404

CLASS 354
149.1 4,893,139
149.11 4,893,140
219 4,893,141
234.1 4,893,142
286 4,893,143
304 4,893,144
400 4,893,145

CLASS 355
27 4,893,147
4,893,148
67 4,893,149
243 4,893,150
245 4,893,151
315 4,893,146
323 4,893,152
325 4,893,153

CLASS 356
152 Re.33,144
243 4,892,405
349 4,892,406
375 4,892,407
400 4,892,408
414 4,892,409

CLASS 357
4 4,893,154
22 4,893,155
23.1 4,893,156
23.13 4,893,157
4,893,158
4,893,159
23.4 4,893,160
24 4,893,161
30 4,893,162
40 4,893,163
42 4,893,164
43 4,893,165
51 4,893,166
4,893,167
68 4,893,168
70 4,893,169
71 4,893,170
72 4,893,171
79 4,893,172
4,893,173
82 4,893,174

CLASS 358
12 4,893,175
31 4,893,176
75 4,893,177
76 4,893,178
79 4,893,179
80 4,893,180
4,893,181
105 4,893,182
107 4,893,183
135 4,893,184
213.17 4,893,185
213.19 4,893,186
261.1 4,893,187
298 4,893,190
4,893,191
336 4,893,192
341 4,893,193
443 4,893,194
454 4,893,195
456 4,893,188
471 4,893,189
474 4,893,196

CLASS 360
8 4,893,197
14.1 4,893,198
48 4,893,199
67 4,893,200
77.04 4,893,201
79 4,893,202
103 4,893,203
4,893,204
104 4,893,205
106 4,893,206
114 4,893,207
118 4,893,208
128 4,893,209
137 4,893,210

CLASS 361
18 4,893,211
91 4,893,212
191 4,893,213
286 4,893,214
395 4,893,215
406 4,893,216
506 4,893,217

CLASS 362
61 4,893,218
66 4,893,219
80.1 4,893,220
108 4,893,221
109 4,893,222
252 4,893,223
287 4,893,224
293 4,893,225
376 4,893,226

CLASS 363
26 4,893,227
89 4,893,228

CLASS 364
140 4,893,229
146 4,893,230
200 4,893,231
4,893,232
4,893,233
4,893,234
4,893,235
405 4,893,236
4,893,237
419 4,893,238
424.05 4,893,239
4,893,240
424.07 4,893,241
426.01 4,893,242
426.04 4,893,243
431.03 4,893,244
435 4,893,245
449 4,893,246
4,893,247
464.01 4,893,248
464.03 4,893,249
470 4,893,250
474.29 4,893,251
483 4,893,252
497 4,893,253
513 4,893,254
4,893,255
518 4,893,256
519 4,893,257
521 4,893,258
525 4,893,259
564 4,893,260
565 4,893,261
567 4,893,262
708 4,893,263
724.1 4,893,264
724.10 4,893,265
726 4,893,266
745 4,893,267
759 4,893,268
784 4,893,269
900 4,893,270
4,893,271

CLASS 365
145 4,893,272
185 4,893,273
189.04 4,893,274
189.08 4,893,276
189.09 4,893,275
203 4,893,277
4,893,278
230.03 4,893,279
230.05 4,893,280
230.06 4,893,281
233.5 4,893,282

CLASS 366
2 4,892,410
25 4,892,411
145 4,892,412
349 4,892,413

CLASS 367
7 4,893,283
12 4,893,284
35 4,893,285
87 4,893,286
91 4,893,287
116 4,893,288
136 4,893,289
178 4,893,290

CLASS 368
10 4,893,291
88 4,893,292

CLASS 369
34 4,893,293
44 4,893,294
75.2 4,893,295
112 4,893,296
275 4,893,297
4,893,298
4,893,299

CLASS 370
3 4,893,300
58.2 4,893,301
60 4,893,302
4,893,303
4,893,304
84 4,893,305
94.1 4,893,307
94.2 4,893,306
109 4,893,308
110.1 4,893,309
4,893,310

CLASS 371
22.5 4,893,311
37.8 4,893,312
223 4,893,072

CLASS 372
46 4,893,313
107 4,893,314

CLASS 374
37 4,893,315

CLASS 375
44 4,893,316
97 4,893,317
109 4,893,318
111 4,893,319

CLASS 376
258 4,892,701
294 4,892,702

CLASS 377
11 4,893,320

CLASS 378
121 4,893,321
173 4,893,322
208 4,893,323

CLASS 379
40 4,893,324
45 4,893,325
53 4,893,326
59 4,893,327
67 4,893,328
88 4,893,329
91 4,893,330
93 4,893,331
97 4,893,332
100 4,893,333
157 4,893,334
200 4,893,335
211 4,893,336
424 4,893,337

CLASS 380
25 4,893,338
28 4,893,339
50 4,893,340

CLASS 381
7 4,893,341
26 4,893,342
156 4,893,343
187 4,893,344

CLASS 382
1 4,893,345
8 4,893,346

CLASS 383
63 4,892,414

CLASS 384
45 4,892,415
58 4,892,416
99 4,892,417
124 4,892,418
322 4,892,419
420 4,892,420
492 4,892,421
549 4,892,422
611 4,892,423
620 4,892,424

CLASS 388
817 4,893,067

CLASS 400
120 4,892,425
708 4,892,426

CLASS 401
182 4,892,427
258 4,892,428

CLASS 403
24 4,892,430
187 4,892,431
297 4,892,432
359 4,892,433
361 4,892,434
374 4,892,435
404 4,892,436

CLASS 404
97 4,892,437
119 4,892,438
4,892,439

CLASS 405
36 4,892,440
146 4,892,441
154 4,892,442
164 4,892,443
195 4,892,444
224 4,892,445
302 4,892,446

CLASS 408
76 Re.33,145
4,892,447

CLASS 409
181 4,892,448

CLASS 411
54 4,892,449
78 4,892,450
383 4,892,429

CLASS 414
217 4,892,451
229 4,892,452
403 4,892,453
406 4,892,454
417 4,892,455
527 4,892,456
735 4,892,457
791.6 4,892,458

CLASS 415
104 4,892,459

CLASS 416
62 4,892,460
134 A 4,892,461
226 4,892,462

CLASS 417
151 4,892,463
201 4,892,464
218 4,892,465
295 4,892,466
353 4,892,467
365 Re.33,142
415 4,892,468

CLASS 418
55 4,892,469

CLASS 419
13 4,892,703

CLASS 420
59 4,892,704

CLASS 422
26 4,892,705
28 4,892,706
51 4,892,707
72 4,892,708
98 4,892,709
102 4,892,710
125 4,892,711
186 4,892,712
186.07 4,892,713
245 4,892,714

CLASS 423
20 4,892,715
213.7 4,892,716
217 4,892,717
235 4,892,718
245.1 4,892,719
328 4,892,720
4,892,721
448 4,892,722
573.1 4,892,723

CLASS 424
49 4,892,724
4,892,725
63 4,892,726
69 4,892,727
70 4,892,728
73 4,892,729
80 4,892,730
85.7 4,892,743
93 4,892,731
409 4,892,732
422 4,892,733
4,892,734
435 4,892,735
4,892,736
449 4,892,737
468 4,892,738
473 4,892,739
474 4,892,740
479 4,892,741
480 4,892,742

CLASS 425
80.1 4,892,470
132 4,892,471
139 4,892,472
197 4,892,473
549 4,892,474

CLASS 426
111 4,892,744
549 4,892,745
4,892,762
598 4,892,746
618 4,892,747
635 4,892,748
646 4,892,749

CLASS 427
27 4,892,750
34 4,892,751
38 4,892,752
4,892,753
54.1 4,892,754
203 4,892,755
206 4,892,756
215 4,892,757
242 4,892,758
249 4,892,759
428 4,892,760
430.1 4,892,761

CLASS 428
34.1 4,892,763
34.5 4,892,764
34.8 4,892,765
36.4 4,892,766
52 4,892,767
57 4,892,768
68 4,892,769
71 4,892,770
74 4,892,771
113 4,892,772
121 4,892,773
174 4,892,774
195 4,892,775
209 4,892,776
212 4,892,777
218 4,892,778
220 4,892,779
234 4,892,780
4,892,781
240 4,892,782
282 4,892,783
288 4,892,784
4,892,785
307.3 4,892,786
331 4,892,787
336 4,892,788
4,892,789
548 4,892,790
698 4,892,791
4,892,792

CLASS 429
60 4,892,793
72 4,892,794
194 4,892,795
196 4,892,796
210 4,892,797

CLASS 430
38 4,892,798
77 4,892,799
85 4,892,800
193 4,892,801
270 4,892,802
380 4,892,803
4,892,804
387 4,892,805
449 4,892,806
505 4,892,807
517 4,892,808
550 4,892,809
553 4,892,810
562 4,892,811
567 4,892,812

CLASS 431
8 4,892,475
36 4,892,476
202 4,892,477

CLASS 433
6 4,892,478
20 4,892,479
73 4,892,480
90 4,892,481
136 4,892,482
229 4,892,483

CLASS 434
259 4,892,484

CLASS 435
4 4,892,813
5 4,892,814
7 4,892,815
11 4,892,816
21 4,892,817
30 4,892,818
68.1 4,892,820
69.1 4,892,819
127 4,892,821
132 4,892,822
138 4,892,823
172.2 4,892,824
180 4,892,825
183 4,892,826
193 4,892,827
240.2 4,892,829
240.27 4,892,828
290 4,892,830
292 4,892,831
311 4,892,832

CLASS 436
97 4,892,833
149 4,892,834

CLASS 437
22 4,892,835
29 4,892,836
31 4,892,837
41 4,892,838
47 4,892,839
52 4,892,840
4,892,841
67 4,892,842
192 4,892,843
194 4,892,844
195 4,892,845

CLASS 439
167 4,892,485
248 4,892,486
260 4,892,487
438 4,892,488
497 4,892,489
533 4,892,490
582 4,892,491
818 4,892,542
828 4,892,492

CLASS 440
17 4,892,493
61 4,892,494

CLASS 441
5 4,892,495
57 4,892,496

CLASS 445
28 4,892,497
44 4,892,498

CLASS 446
81 4,892,499
221 4,892,500
372 4,892,501
454 4,892,502
456 4,892,503

CLASS 455
52 4,893,347
89 4,893,348
205 4,893,349
278 4,893,350
347 4,893,351
610 4,893,352
612 4,893,353
4,893,354

CLASS 460
112 4,892,504
149 4,892,505

CLASS 474
49 4,892,506
50 4,892,507
101 4,892,508
237 4,892,509
252 4,892,510

CLASS 493
194 4,892,511
4,892,512
316 4,892,513
413 4,892,514
956 4,892,515

CLASS 501
8 4,892,846
14 4,892,847
97 4,892,849
127 4,892,850

CLASS 502
104 4,892,851
107 4,892,852
112 4,892,853
160 4,892,854
200 4,892,855
205 B1 4,438,217
247 4,892,856
439 4,892,857

CLASS 503
227 4,892,858
4,892,859
4,892,860

CLASS 505
1 4,892,861
4,892,862

CLASSIFICATION OF PATENTS

4,892,863

CLASS 514

43 4,892,865
119 4,892,866
132 4,892,888
178 4,892,867
182 4,892,868
210 4,892,869
211 4,892,870
227.2 4,892,871
230.5 4,892,872
245 4,892,952
247 4,892,947
248 4,892,873
249 4,892,874
253 4,892,875
265 4,892,876
289 4,892,877
327 4,892,878
338 4,892,879
342 4,892,880
356 4,892,881
380 4,892,882
460 4,892,884
464 4,892,883
478 4,892,885
510 4,892,864
567 4,892,886
601 4,892,887
774 4,892,889
784 4,892,890

CLASS 521

69 4,892,891
107 4,892,892
128 4,892,893

CLASS 522

31 4,892,894
99 4,892,895

CLASS 523

300 4,892,896
404 4,892,897

CLASS 524

3 4,892,898
83 4,892,899
141 4,892,900
181 B1 4,120,845
303 4,892,901
417 4,892,902
488 4,892,903
494 4,892,904
499 4,892,905
730 4,892,906
731 4,892,907

CLASS 525

160 4,892,908
216 4,892,909
221 4,892,910
240 4,892,911
338 4,892,928
437 4,892,912
452 4,892,913

CLASS 526

114 4,892,914
259 4,892,915
304 4,892,916
318 4,892,917

CLASS 528

15 4,892,918
48 4,892,919
61 4,892,920
183 4,892,921
190 4,892,922
4,892,923
196 4,892,924
219 4,892,925
305 4,892,926
324 4,892,927
480 4,892,929
487 4,892,930
493 4,892,931
499 4,892,932

CLASS 530

387 4,892,933
4,892,934
4,892,935

CLASS 534

595 4,892,936
652 4,892,937

CLASS 536

18.5 4,892,938
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305,431
48 : 305,395
305,424
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51 : 305,448
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